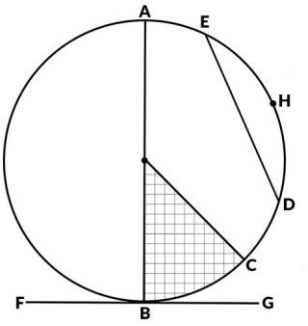
Edge Hill University

Standalone Test
Revision Support

GCSE Maths
Equivalency Exam



For tests from September 2019 onwards
Version 1.0
1 September 2019

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Introduction

Edge Hill University

Thank you for choosing Edge Hill University for your equivalency test. As a leading university, we are dedicated to creating opportunity from knowledge – a philosophy that drives our teaching, our academic research, and our commitment to providing students with a great experience leading to a rewarding career.

The University provides a package of targeted support to applicants and students, aimed at ensuring that individuals with the capacity to benefit from higher education can come to university, stay at university and take advantage of opportunities while they study.

We are continually recognised for our outstanding achievements in student support, graduate employment and innovation, as well as our significant role in transforming lives. Joining us means studying on one of the best campuses in UK higher education, as part of a unique and welcoming academic community.

Equivalency Exams

This information pack is designed to support your revision in preparation for the exam. It is not designed to emulate the exams in any way.

The Edge Hill equivalency tests offer you the opportunity to demonstrate that you satisfy our entry requirements for GCSE English, GCSE Mathematics and GCSE Science at Grade C or Grade 4 or above for most of our programmes, excluding Medicine.

Standalone tests allow you to revise at home, before booking to sit your exam on selected dates throughout the year at either Edge Hill University or Holy Cross College in Bury.

Once you have booked and paid for the test, you can revise at your own pace. However, we do ask that you make at least one attempt at the chosen exam within one year of payment. Refunds can be requested either within 1 year of payment, or prior to attempting the exam (whichever of these is the earliest). This applies to standalone exams only.

Please be aware that Edge Hill University Equivalency Exams are designed to meet the GCSE requirements for Edge Hill University only. Other institutions or governing bodies may accept them, however, it is important that you check with your chosen training provider that this equivalent exam will be accepted. If any issues arise please pass your details and the provider's details to edgehilltests@edgehill.ac.uk and we can provide copies of our exam specification.

This specification is for the GCSE Maths Equivalency Test.

Why choose Edge Hill University Equivalency Programmes?

Value for Money

- Past papers are posted to you free of charge.
- We provide high quality, professionally written, GCSE equivalency exams which are well supported and professionally administered.
- Exams are professionally assessed, and results are returned promptly, generally within two - four weeks.
- We offer tutor-led revision courses to support candidates.
- We also offer standalone tests on a range of exam dates advertised in advance, both on campus at Edge Hill University, or at Holy Cross College in Bury, Greater Manchester.
- Candidates have two further opportunities to re-sit their exam if they are unsuccessful in the first instance.
- Our charges cover our costs and are lower than most other providers.

Our expertise

- The Edge Hill Equivalency Tests team have been offering equivalency examinations to help students progress on to degree programmes for over 20 years. We are part of the Access Programmes Team, enabling access to university by offering equivalency tests and revision support. Plus, delivery of Edge Hill's highly successful 'Fastrack' access programme which provides a free entry route for people lacking the necessary qualifications, study skills and confidence to enter higher education directly.
- Our equivalency tests team is made up academic tutors, former teachers and university admissions staff; we know how to best assist applicants through this process.
- Academic professionals write and deliver our equivalency programmes, including professional examiners and trained exam invigilators.
- All examinees are ID checked by staff with compliance training.

Customer Service

- The Equivalency Tests team are available Monday-Friday, 9am-5pm, to support candidates with any queries.
  You can call 01695 657148
  Or email edgehilltests@edgehill.ac.uk.

Security and Accountability

- Banks of exams in each subject are regularly rotated to ensure examinees sit fresh exams.
- Completed exams, marking schemes, profiles of markers and evidence of specific learning difficulties (where relevant) are kept secure for five years before being disposed of in accordance with standard University procedure.

Purpose of study

The GCSE Maths equivalency test will allow students to be awarded an equivalent qualification for entry onto most Edge Hill University degree programmes (excluding Social Work and Medicine), where GCSE Maths is included in the entry requirements.

Exam Specification at a Glance

Candidates study at **Intermediate Level** and could potentially achieve a Grade 5 as a maximum level of attainment. You must achieve at least 45% to pass the GCSE Maths equivalency test with a Grade 4 equivalent.

The GCSE Maths equivalency exam is 2 hours and 30 minutes in duration. Candidates will sit a calculator paper first, 1 hour and 15 minutes in duration, immediately followed by a non-calculator paper, which is also 1 hour and 15 minutes in duration.

The topics covered in the GCSE Maths equivalency exam are as follows:

- Number and Algebra
- Shape and Space
- Handling Data

Calculator Paper	Non-Calculator Paper
Assessment Format • Written exam, 1 hours and 15 minutes in duration. • 60 marks available. • Content from any part of the specification may be assessed. • A calculator should be used.	**Assessment Format** • Written exam, 1 hours and 15 minutes in duration. • 60 marks available. • Content from any part of the specification may be assessed. • A calculator cannot be used.
• A mix of question styles, from short, single-mark questions to multi-step problems. The mathematical demand increases as a student progresses through the paper. • Candidates must achieve at least 45% overall to pass the exam. • 45% = Grade 4 equivalent (previously Grade C, standard pass). • 65% = Grade 5 equivalent (previously Grade B).	

How the new numbered grades compare with the old lettered grades:

Current grading structure	Old grading structure
9	A*
8	
7	A
6	B
5	
4	C
3	D
2	E
	F
1	G
U	U

Scheme of Assessment

Candidates attend either a 12-week revision course (12 x 3 hour tutor-led sessions) or a 4 week revision course (4 x 3 hour tutor led sessions) followed by an exam on a pre-arranged date.

There is also the option to sit a standalone test, designed for the syllabus to be studied at home with a written examination taken within 12 months of registration. Candidates are sent a revision pack containing guidance and past papers to support their revision.

GCSE equivalency exams are available 12 months per year on advertised dates: https://www.edgehill.ac.uk/tests

See “Resits and shelf life” in the General Administration section.

All materials are available in English only. See “Access Arrangements” for details of our provision for candidates with additional needs.

Aims

Mathematics is a creative and highly inter-connected discipline that is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.

This specification in mathematics enables students to:

- develop fluent knowledge, skills and understanding of mathematical methods and concepts.
- acquire, select and apply mathematical techniques to solve problems.
- reason mathematically, make deductions and inferences and draw conclusions.
- comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.

Assessment Objectives

We follow the assessment objectives set by The Office of Qualifications and Examinations Regulation (**Ofqual)** which are applied to all GCSE Maths specifications and all exam boards. Therefore, the exam will measure how candidates have achieved the following assessment objectives:

AO1	Use and apply standard techniques. Students should be able to: • accurately recall facts, terminology and definitions • use and interpret notation correctly • accurately carry out routine procedures or set tasks requiring multi-step solutions.
AO2	Reason, interpret and communicate mathematically. Students should be able to: • make deductions, inferences and draw conclusions from mathematical information • construct chains of reasoning to achieve a given result • interpret and communicate information accurately • present arguments and proofs • assess the validity of an argument and critically evaluate a given way of presenting information.
AO3	Solve problems within mathematics and in other contexts. Students should be able to: • translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes • make and use connections between different parts of mathematics • interpret results in the context of the given problem • evaluate methods used and results obtained • evaluate solutions to identify how they may have been affected by assumptions made.

Subject content

In addition to this subject content, students should be able to recall, select and apply mathematical formulae.

Number and Algebra	
Topic	**Notes**
Understand place value	Read and write whole numbers expressed in figures and words. Order whole numbers to the nearest 10, 100, 1000 etc. Round decimals to the nearest whole number or a given number of decimal places. Round numbers to a given number of significant figures.
Understand and use decimals, fractions and percentages	Show equivalence between the three forms. Use and apply the four rules of numbers to decimals and fractions. Calculate percentages of a quantity and express a given number as a percentage of another.
Negative numbers	Using and applying the four rules of number to negative numbers.
Ratio	
Index notation, including standard form	Express and use number in standard form with positive and negative powers of 10.
Understand and use common number properties	Show familiarity with multiples, factors, primes, HCF & LCM, powers and roots.
Manipulate algebraic expressions	Collect like terms; find common factors; multiply two simple brackets; factorise expressions in the form $ax^2 + bx + c$
Manipulate algebraic expressions - continued	Apply the rules of indices to simplify algebraic expressions.
	Change the subject of a formula.
Solve equations	Linear equations.
	Simultaneous equations in two unknowns.
	Quadratic equations using factorization.
	Use Trial and Improvement to solve equations.
Solve inequalities	
Number sequences	Explore number patterns and find a general expression to describe the nth term of a sequence where the rule is linear or quadratic.

Shape and Space	
Topic	**Notes**
Graphs	Plotting Cartesian Coordinates.
	Conversion graphs, distance time graphs.
	Draw and interpret graphs of linear functions and quadratic functions. $y = mx + c$
	Use graphs to solve simultaneous equations.
Transformations in a plane	Translation, reflection, rotation and enlargement.
Name and understand the properties of simple 2D and 3D shapes	Angle properties of polygons including interior and exterior angles.
	Angle properties of parallel lines and transversals (corresponding, alternate and interior or allied angles).
Name and understand the properties of simple 2D and 3D shapes – continued.	Area and perimeter of triangles, rectangles. Area of parallelograms, trapeziums. Circumference and area of a circle.
	Volumes of cuboids, cylinders and regular prisms.
Pythagoras Theorem	Solve problems in two dimensions.
Trigonometry	Solve problems in right angled triangles using sin, cos and tan.
Bearings	3 figure bearings and scale diagrams.
Locus	Points equidistant from: (a) a point (b) a line

Handling Data	
Topic	**Notes**
Data collection and representation	Tally charts. Grouped frequency tables. Cumulative frequency tables. Bar charts. Pie charts. Cumulative frequency curves. Scatter graphs.
Interpreting data	Find the range of a set of data. Find averages using mean, median and mode. Using cumulative frequency curves to find the median, upper and lower quartiles and interquartile range of a set of data. Box and Whisker diagrams.
Probability	Outcomes of a combination of 2 experiments. Using tree diagrams and sample space diagrams.

Mathematical Formulae

Students are expected to know the following formulae included in the subject content; they will not be given in the exam.

Circumference and area of a circle	Where r is the radius and d is the diameter: Circumference of a circle = $2\pi r = \pi d$ Area of a circle = πr^2
Pythagoras' theorem	In any right-angled triangle where a, b and c are lengths of the sides and c is the hypotenuse: $a^2 + b^2 = c^2$
Trigonometry formulae	In any right-angled triangle ABC where a, b and c are lengths of the sides and c is the hypotenuse: $\sin A = \frac{a}{c}$, $\cos A = \frac{b}{c}$, $\tan A = \frac{a}{b}$
Compound interest	Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded: Total accrued = $P\left(1 + \frac{r}{100}\right)^n$
Kinematics formulae	Where a is constant acceleration, u is initial velocity, v is final velocity, s is displacement from the position when $t = 0$ and t is time taken: $v = u + at$ $s = ut + \frac{1}{2}at^2$ $v^2 = u^2 + 2as$
Students are **not** expected to memorise the following formulae; they will be given in the exam in the relevant question.	
Perimeter, area, surface area and volume formulae	Where r is the radius of the sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone: Curved surface area of a cone = πrl Surface area of a sphere = $4\pi r^2$ Volume of a sphere = $\frac{4}{3}\pi r^3$ Volume of a cone = $\frac{1}{3}\pi r^2 h$
Trigonometry formulae	In any triangle ABC where a, b and c are lengths of the sides: sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$ Area = $\frac{1}{2}ab\sin C$
Perimeter, area, surface area and volume formulae	Where a and b are the lengths of the parallel sides and h is their perpendicular separation: Area of a trapezium = $\frac{1}{2}(a + b)h$ Volume of a prism = area of cross section x length

General Administration

Further information about our range of equivalency programmes can be found at www.edgehill.ac.uk/tests

Equivalency Tests

Edge Hill University Equivalency Exams are designed to meet the GCSE requirements for Edge Hill University only. Candidates are advised that other institutions or governing bodies may accept them, however, it is the candidates' responsibility to check that this equivalent exam will be accepted.

Awarding grades and reporting results

These tests are designed and delivered by the Access Programmes Team at Edge Hill University and are not validated through a national examination body.

Candidates who are successful in passing the exam receive a certificate from Edge Hill University. We will post your certificate to your registered address within 10 working days. You must notify us within 15 working days if you haven't received the certificate, otherwise, after this time there will be a charge.

It is the candidate's responsibility to inform Edge Hill Tests of a change of address. Please contact us if you have changed address since registering for your test so that we can send your certificate to the correct location.

Re-sits and shelf life

Candidates have two further opportunities to re-sit their exam if they are not successful in the first instance.

Candidates are informed that they must keep their certificate safe; after five years we cannot guarantee that we will be able to retrieve their results and confirm that they sat and passed an equivalency test at Edge Hill University. If candidates lose their certificate or require a replacement, the charge is £5.

Previous learning and prerequisites

The 12-week courses require some prior subject knowledge (i.e. they are not suitable for complete beginners). The 4-week courses are suitable if the candidate has a sufficiently advanced level of existing subject knowledge and understanding to not require the longer 12-week programme.

Standalone GCSE tests are for candidates who are not able to join one of our equivalency courses, or feel that, with some self-revision, their subject knowledge is already sufficient.

Access Arrangements

We make reasonable adjustments to the exam format to meet the requirements of our candidates with additional needs.

We ask candidates who have a disability or a specific learning difficulty to speak to us in advance so that we can discuss their requirements and make the arrangements. In certain circumstances, this may mean arranging a private exam. Candidates are asked to contact the Equivalency Tests Team to provide evidence of a specific learning requirements, such as an educational Psychology Report or Needs Assessment, **at least five working days prior to the exam date**. It is not possible to guarantee being able to meet requests made on the day of the test.

We are unable to approve extra time in exams for candidates on the basis that English is their second language. All candidates must be assessed according to the same marking criteria and following the same regulations, so that grades and certificates have the same validity.

Access Programmes Team

Janet Fairclough - Access Programmes Manager
Anne-Marie Kennedy – Pre-Entry Advice and Guidance Officer
Lindsey Tetlow – Senior Admissions Administrator (Access Programmes)
Joanne Williams – Admissions Assistant
Vicki Guttridge – Admissions Assistant

Contact Us

You can visit our website for information about all of our equivalency programmes:
www.edgehill.ac.uk

The Equivalency Tests team are available Monday-Friday, 9am-5pm.

If you have any queries about equivalency tests, please get in touch:
T: 01695 657148
E: edgehilltests@edgehill.ac.uk

Your GCSE Maths Equivalency Exam



Revision Guidance

This information pack contains a list of the topics which you will need to revise for your exam, as well as exam preparation information and practise papers. The pack is designed to support your revision in preparation for your equivalency exam, but it is not designed to emulate the exams in any way.

You will need to use additional revision materials.

Text books:

Any Intermediate Level GCSE Mathematics book on the market will cover all the main points in the syllabus.

Online:

The BBC GCSE Bitesize website is also a useful resource for many of the topics: https://www.bbc.com/bitesize/subjects/z38pycw

You should follow the advice given in the AQA or Edexcel specifications.

AQA: https://www.bbc.com/bitesize/examspecs/z8sg6fr



Exam Preparation

Please take time before each exam to read the instructions on the front of the exam paper.

GCSE Maths equivalency standalone test:

- 2.5 hours in duration.
- 75 minute calculator paper, immediately followed by a 75 minute non-calculator paper.

You much achieve at least 45% to pass the test.

45% = Grade 4 equivalent
(previously Grade C, standard pass).

65% and above = Grade 5 equivalent
(previously Grade B).

What to bring with you:

You will need to bring photo ID to register for the exam.

Acceptable ID includes: passport, driving license, recognised age ID card, residential permit, student or NUS Card.

If you have recently changed your name you must bring additional evidence such as a change of name document or marriage certificate. If you feel your name has not been registered correctly please contact us prior to the exam.

GCSE Maths:

- A blue/black pen
- A pencil
- A protractor
- A ruler
- A scientific calculator

Receiving Results

Please allow at least 4 weeks for your paper to be marked.

Unless otherwise requested, candidates will initially be informed of results by telephone. If you are successful in passing the exam, confirmation will also be made in writing and posted to your registered address.

Contact

The Equivalency Tests team are available Monday-Friday, 9am-5pm.

If you have any queries about equivalency tests, please get in touch by calling 01695 657148 or emailing edgehilltests@edgehill.ac.uk

On the Day of Your Exam



Please read the following information carefully, as it contains important information about the terms and conditions of Edge Hill University Standalone Equivalency Exams.

Arriving for your exam

You have been asked to arrive 30 minutes before the start of the exam for registration. This will allow us time to register everyone. Please wait outside the exam room until registration begins.

If you arrive 0-15 minutes after the start of the exam, you will be able to sit your test, but you will not be given any extra time.

If you arrive more than 15 minutes after the start of the exam, you will be refused entry and advised to re-book your test; this will not count as one of your attempts.

Registration and Identification Checks

All examination candidates must bring a photo ID document to register for the exam. Acceptable ID includes: passport, driving licence, recognised age ID card, residential permit, student or NUS Card. The ID must contain a visible name and a photograph with a clear resemblance to the candidate sitting the examination. If you have recently changed your name you must bring additional evidence such as a change of name document or marriage certificate. If you feel your name has not been registered correctly please contact us prior to the exam.

The Invigilator in the examination venue will check each candidate's ID in advance of the exam. If an invigilator has any doubts over the validity of a candidate's ID, or if the candidate has not brought their ID or any other form of photographic identification with them to the examination, the candidate will still be allowed to sit the examination, however, they will be required to take a photograph of themselves on the day of the exam and email it to edgehilltests@edgehill.ac.uk along with a photograph of a valid ID document.

Edge Hill University acknowledges that some examination candidates will choose to wear religious dress, for example: turbans and hijabs/veils. It may be necessary, for the purposes of identification before an examination, to ask a student to remove any garment that obscures their identity. In the case of a female student who is asked to remove a veil in order for the Invigilator to confirm their identity, an appropriate female member of staff will accompany the student to a private area where they can remove their veil to enable identification to take place.

Invigilators

The role of the invigilators is to supervise your exam and make sure your exams take place according to the rules and that the rules are applied fairly. You must follow any instructions given by an invigilator. It is your responsibility to listen to and follow these instructions.

If anything unexpected happens to you during an exam, such as feeling unwell, you should notify the invigilator immediately.

Additional Needs

We are happy to make reasonable adjustments to the exam format in order to meet the requirements of our candidates with additional needs.

All venues are accessible. However, if you have a disability or a specific learning difficulty, we do recommend that you speak to us in advance so that we can discuss your requirements and to allow us time to make the arrangements. In certain circumstances, this may mean you need to sit the exam on an alternative date.

Please contact the Equivalency Tests Team to let us know and provide evidence **at least five working days prior to the exam date**. It is not possible to guarantee being able to meet requests made on the day of the test.

Please contact edgehilltests@edgehill.ac.uk with evidence of your specific learning requirements such as an educational Psychology Report or Needs Assessment, or call 01695 657148 if you wish to discuss anything.

Your conduct

Improper conduct and actions that cause a disturbance during an exam are considered malpractice. They are unfair for other candidates and penalties often include losing marks or having your exam entry cancelled.

Examples of malpractice by candidates include:

- Pretending to be someone else or getting someone else to attempt to sit an exam for you.
- Disruptive behaviour in the exam room.
- Using rude, abusive, offensive or discriminatory language or images in your answer booklet.
- Copying from another candidate.
- Using any material or aids that would give you an unfair advantage in the exam.

Rules

It is important that you follow the test rules, to make sure that everyone has a fair and equal chance of doing their best work:

- When you enter the exam room you are under **exam conditions**; you must be silent, you must not communicate with anyone else in the room, or disturb other candidates.
- **All personal belongings** and any revision materials should be stored under your chair or table and out of your / your fellow candidates' line of vision.
- Mobile phones and web enabled devices must be switched OFF, put inside the **clear plastic bag** provided and placed on top of your desk for the duration of the exam. Phones cannot be used as calculators or timing devices.
- Any pencil cases should be clear plastic if they are on top of your desk.
- **Water** can be brought into the exam room in clear bottles.
- **You cannot eat food**, unless you have notified us of a medical condition.
- If you need to visit the bathroom during the exam, you cannot take any exam materials including stationery with you. Additional time is not allowed for such breaks (unless specified under an additional needs report).
- Dictionaries/ thesauruses are not permitted in any exam.
- If you require any assistance during the exam, please raise your hand and wait for the invigilator to approach you.

Question papers and answer booklets

It is important to read the instructions on the front of your exam paper. Make sure you follow them carefully and note the duration of your exam.

If you need extra paper, you should raise your hand and ask the invigilator.

You must complete your details legibly on the front of the question paper or answer booklet. If using extra paper, remember to write your name and the exam date on each sheet and put these inside your answer booklet.

Work through your question paper until you see the statement END OF EXAM. There will be nothing else you need to answer after this.

Writing your answers

You must use a pen with black or blue ink and it is important that you write legibly. Markers will do their best to read your work, but they might not be able to award marks if your writing is difficult to read.

In some subjects, poor spelling and punctuation could also result in marks not being awarded.
Remember to cross out any rough work or unwanted answers if you make more than one attempt at a question.

Leaving the exam room

You can leave the exam if you finish early, but please be considerate of other candidates who may still be working. Please be aware that talking outside of the exam room can be very distracting.

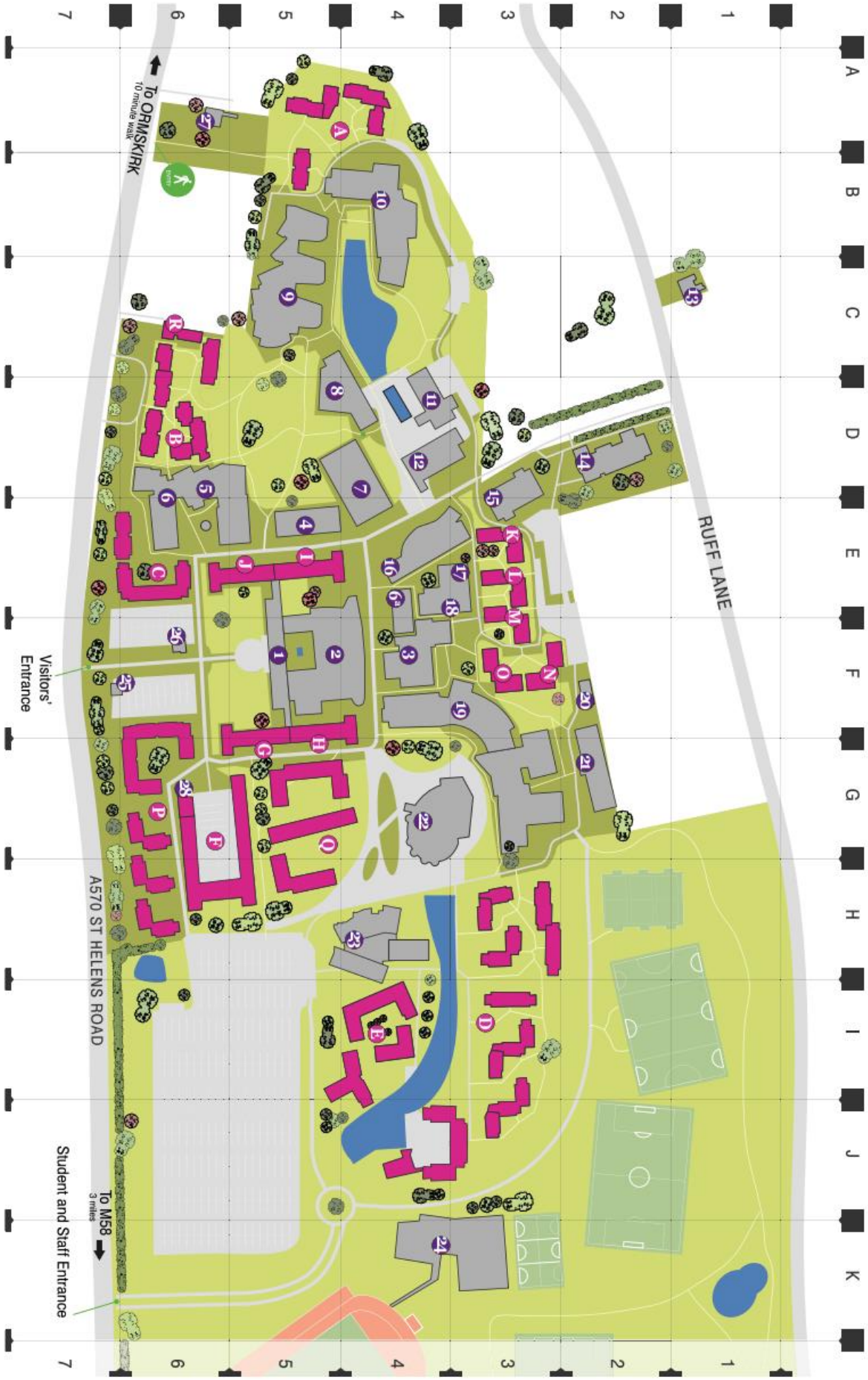
All exam papers, scrap paper and answer booklets must be handed in at the end of the exam. You could lose all marks for the paper concerned if you do not give your answer booklet to the invigilator before leaving the exam room, or when requested.

Subject Papers

Please take time before each exam to read the instructions on the front of the exam paper.

GCSE Maths equivalency standalone test:
2.5 hours - 75 minute calculator paper, immediately followed by a 75 minute non-calculator paper.

Edge Hill University, Ormskirk



BUILDING LOCATIONS

	Number	Grid
BioSciences	15	D3
Business School	16	E4
Catalyst	22	G4
Creative Edge	23	H4
Durning Centre	21	G2
Faculty of Education (Lakeside)	10	B4
Faculty of Education (Piazza)	11	D4
Faculty of Education (Professional Learning)	17	E3
Faculty of Health and Social Care	9	C5
GeoSciences	12	D4
Health and Wellbeing Centre, Milton House	13	C1
Hargrave	27	A6
Laurels	20	F2
Law and Psychology	7	E4
Lodge	25	F6
Magnolia	28	G6
Medical School	8	D4
Old Gym	18	E3
Performing Arts	6	E6
Main Reception	1	F5
Security and Customer Information Centre	26	F6
Sport and Physical Activity Building (Wilson Centre)	19	F4
Student Administration	4	E5
The Hub	2	F5
Students' Union	3	F4
Tech Hub	14	D2
The Arts Centre	5	E6
The Sports Centre	24	K4

Department	Building	Number	Grid
Academic Registry	Student Administration	4	E5
Academic Quality and Development Unit	Main Building (Clough)	1	F5
Accommodation Office (Student Services)	Catalyst	22	G4
Admissions	Student Administration	4	E5
Arts Centre	The Arts Centre	5	E6
Biology, Department of	BioSciences	15	D3
Business School	Business School Building	16	E4
Capital Projects	Durning Centre	21	G2
Careers Centre	Catalyst	22	G4
Chaplaincy Service	Students' Union	3	F4
Computer Science, Department of	Tech Hub	14	D2
Confucius Institute	The Lodge	25	F6
Corporate Communications	Main Building	1	F5
Course Enquiries	Student Administration	4	E5
Deliveries	Durning Centre	21	G2
Directorate	Main Building	1	F5
Education, Faculty of	Faculty of Education (Lakeside)	10	B4
Education: Early Years Children, Education and Communities	Faculty of Education (Lakeside)	10	B4
Education: Professional learning	Faculty of Education (Professional Learning)	17	E3
Education: Secondary, Further Education Education programmes	Faculty of Education (Piazza)	11	D4
English, History and Creative Writing	Main Building (Clough)	G	G6
Facilities Management	Durning Centre	21	G2
Faith and Reflection Room	Magnolia	28	G6
Finance Office	Main Building (Lady Margaret)	J	E5
Geography, Department of	GeoSciences	12	D4
Hale Hall	Main Building (Hub)	1	F4
Health and Social Care, Faculty of	Faculty of Health and Social Care	9	C5
Health and Wellbeing Centre	Milton House	13	C1
Human Resources	Main Building (Lady Margaret)	J	G6
International Office	Main Building (Stanley)	H	G5
IT Services	Durning Centre	21	G2
Language Centre	Law and Psychology	7	E4
Law and Criminology, Department of	Law and Psychology	7	E4
Library	Catalyst	22	G4
Media, Department of	Creative Edge	23	H4
Medical School	Medical School	8	D4

Department	Building	Number	Grid
Performing Arts, Department of	The Arts Centre	5	E6
Performing Arts, Department of	Performance Studio	6a	E4
Psychology, Department of	Law and Psychology	7	E4
Reception	Main Building	1	F5
Research Office	Business School	16	E4
Security	Security and Customer Information Centre	26	F6
Social Sciences, Department of	Creative Edge	23	H4
Sport and Physical Activity, Department of	Sport and Physical Activity	19	F3
Strategic Planning and Policy Unit	Student Administration	4	E5
Student Experience	Student Administration	4	E5
Student Financial Support	Catalyst	22	G4
Student Recruitment	Student Administration	4	E5
Student Services	Catalyst	22	G4
Students' Union Bar	The Street	3	F4
Students' Union Office	The Hub	2	F4
Sports Centre	Sports Centre	24	K4
Teaching and Learning Development Unit	The Lodge	25	F6
Vice-Chancellor's Office	Main Building	1	F5
Food, Drink and Shopping			
Café Rewind	Faculty of Health and Social Care	9	C5
53.3° North	Catalyst	22	G4
Starbucks (We Proudly Brew)	Student Hub	2	E4
Grab and Go Snack Bar	Student Hub	2	F4
McColl's (Shop)	Student Hub	2	F4
Students' Union Bar	Students' Union	3	F4
Students' Union Shop	Students' Union	3	F4
Subway	Students' Union	3	F4
The Red Bar	The Arts Centre	5	E6
Waters Edge	Faculty of Education (Lakeside)	10	C4
Cashpoints (ATM)	The Hub	2	E4
	Security and Customer Information Centre	26	F6

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HALLS OF RESIDENCE

A	Graduates Court	A4, A5, B5	F	Forest Court	G6	K	Eleanor Rathbone	E3	P	Palatine Court	G6
B	Founders West	C6 - D6	G	Clough	G5	L	Lady Openshaw	E3	Q	Woodland Court	G5 - H5
C	Founders East	E6	H	Stanley	G5	M	Katherine Fletcher	F3	R	Hollies (Guest Accommodation)	C6
D	Chancellors Court	H3 - J3	I	John Dalton	E5	N	EM Butterworth	F3			
E	Chancellors South	I4	J	Lady Margaret	E5	O	Margaret Bain	F3			

Edge Hill University

Holy Cross College in Bury, Greater Manchester

For exam candidates who live closer to Manchester, we hold some of our exams at Holy Cross College on selected Tuesday evenings from 5:30pm.

PLEASE NOTE: There is NO onsite parking. A lot of streets in the areas surrounding Holy Cross are residential parking or two-hour parking only. Please carefully check signs when parking and allow time to travel from your parking space to the college. You must sign in at Main Reception on arrival and the invigilator will collect you and lead you to the exam room.



Syllabus: Revision Checklist



Your equivalency exam will cover the topics below.

You can use these pages as a revision checklist. Tick ✓ the topics as you revise them.

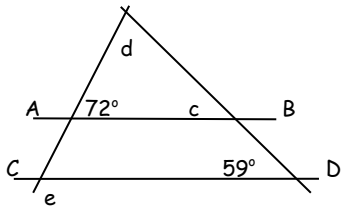
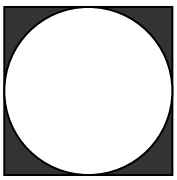
Number and Algebra

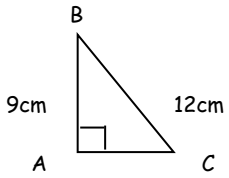
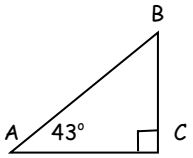
✓	Topic	Notes	Sample Questions
	Understand place value	Read and write whole numbers expressed in figures and words. Order whole numbers to the nearest 10, 100, 1000 etc. Round decimals to the nearest whole number or a given number of decimal places. Round numbers to a given number of significant figures.	1. Write three hundred thousand, two hundred and six as a number. 2. Write the number 5.6479 correct to a) one decimal place b) three significant figures
	Understand and use decimals, fractions and percentages	Show equivalence between the three forms. Use and apply the four rules of numbers to decimals and fractions. Calculate percentages of a quantity and express a given number as a percentage of another.	3. Express the fraction $\frac{3}{5}$ as a) a decimal b) a percentage 4 A car which had been bought for £5,000 is sold for £3,500 three years later. Calculate the percentage loss on the deal. 5. $\frac{4}{5} \times \frac{20}{32}$
	Negative numbers	Using and applying the four rules of number to negative numbers.	6. (-3) + (+8) 7. (-9) – (-2) 8. (-3) x (- 11) 9. (+27) ÷ (- 3)
	Ratio		10. Divide £300 in the ratio 7: 8

	Index notation, including standard form	Express and use number in standard form with positive and negative powers of 10.	11. Write these numbers in standard form: a) 6,340 b) 0.000762 12. Give your answer to the following calculation in standard form: $4.5 \times 10^{-4} \times 4.0 \times 10^{-1}$ 13. Re write this list of numbers in order of size, starting with the smallest. 8.17×10^{3} 5.55×10^{-5} 2.88×10^{2} 7.22×10^{-5} 5.27×10^{5}
	Understand and use common number properties	Show familiarity with multiples, factors, primes, HCF & LCM, powers and roots.	14. Express 24 as a product of its prime factors 15. Find the HCF of 12 and 8 16. Which is larger 2^3 or 3^2?
	Manipulate algebraic expressions	Collect like terms; find common factors; multiply two simple brackets; factorise expressions in the form $ax^2 + bx + c$	17. Simplify the following expression: $4x - 8y - 3x + 7y$ 18. Factorise a) $9cd + 12de$ b) $3ab^2 - a^2b^3$ c) $x^2 - x - 12$ 19. Multiply $(2x + 5)(x - 3)$
	Manipulate algebraic expressions - continued	Apply the rules of indices to simplify algebraic expressions.	20. Simplify a) $6x^5 \div 3x^2$ b) $2x^2 \times 3x^3$ c) $(3x^2)^3$
		Change the subject of a formula.	21. Rearrange the following formula to make **s** the subject $t^2 - rs = q$
	Solve equations	Linear equations.	22 Find the value of x when: a) $2x + 5 = 11$ b) $5x + 5 = 7x - 21$
		Simultaneous equations in two unknowns.	23 Find the values of x and y when: a) $3x + 4y = 23$ b) $2x - 3y = 4$
		Quadratic equations using factorisation.	24 Find the value of x when $x^2 - 2x - 15 = 0$

		Use Trial and Improvement to solve equations.	25 Find the value of x to two places of decimals if $x^3 = 38$ i.e. If x = 3, $x^3 = 27$ - too small if x = 4, $x^3 = 64$ – too big if x = 3.5, $x^3 = 42.825$ – too big if x = …….
	Solve inequalities		26 Find the range of values of x if: a) $3x - 6 \leq 12$ b) $x^2 \geq 16$
	Number sequences	Explore number patterns and find a general expression to describe the nth term of a sequence where the rule is linear or quadratic.	27 Find the next term and the nth term in each of these sequences: a) 2, 5, 8, 11, 14 ……. b) 0, 2, 6, 12, 20 ……

Shape and Space

✓	Topic	Notes	Sample Questions
	Graphs	Plotting Cartesian Coordinates.	28. The points ABCD form a square. If A is the point (-1 , 2), B is (4 ,2) and C is (4 , -3), find the coordinates of the point D.
		Conversion graphs, distance time graphs.	See specimen papers.
		Draw and interpret graphs of linear functions and quadratic functions. $y = mx + c$	29. Draw the graph of $y = x^2 - 5$ where $-4 \leq x \leq 4$. From the graph, find the values of x when $y = 0$.
		Use graphs to solve simultaneous equations.	30. Draw the graphs of $y = 3x - 5$ and $y = 3 - x$. Use the graph to solve the simultaneous equations $y = 3x - 5$ $y = 3 - x$
	Transformations in a plane	Translation, reflection, rotation and enlargement.	31. Draw x and y axes from –10 to +10. Plot the following points and join them up: A (-4,4), B (-3,4), C (-3,3), D (-2,3), E (-2,2), F (-4,2) (a) Draw an enlargement with a scale factor of 2 for this shape, using (-6,7) as the centre of enlargement. (b) Draw the reflection of ABCDEF in the line $x = 2$. (c) Rotate ABCDEF about the point (-6,1), through an angle of 90° in a clockwise direction.
	Name and understand the properties of simple 2D and 3D shapes	Angle properties of polygons including interior and exterior angles.	32.A hexagon has angles of 155°, 98° and 89°. The other three angles are equal. Find the size of the remaining angles.
		Angle properties of parallel lines and transversals (corresponding, alternate and interior or allied angles).	33. Find the size of the missing angles if AB is parallel to CD. 
	Name and understand the properties of simple 2D and 3D shapes – continued.	Area and perimeter of triangles, rectangles. Area of parallelograms, trapeziums. Circumference and	34. Calculate the size of the shaded area if the side of the square is 20cm. 

		area of a circle.	
		Volumes of cuboids, cylinders and regular prisms.	35. Find the volume of a tin of beans with a radius of 3cm and height 7cm. 
	Pythagoras Theorem	Solve problems in two dimensions.	36. In a triangle ABC, A = 90°, AB = 9cm and BC = 12cm. Find the length of AC correct to 1 decimal place 
	Trigonometry	Solve problems in right angled triangles using sin, cos and tan.	37.If angle BAC = 43° and AB = 10 cm, find the length of AC and BC. Give your answer correct to two places of decimals. 
	Bearings	3 figure bearings and scale diagrams.	38. A boat leaves a harbour A and sails 5km south – west to a point B, and then 3km south to a point C. By use of an accurate scale drawing, find on what bearing it must sail to head directly back to harbour and how far it has to sail.
	Locus	Points equidistant from (a) a point (b) a line	

Handling Data

<table>
<tr><th>✓</th><th>Topic</th><th>Notes</th><th>Sample Questions</th></tr>
<tr><td></td><td>Data collection and representation</td><td>Tally charts.

Grouped frequency tables.

Cumulative frequency tables.

Bar charts.

Pie charts.

Cumulative frequency curves.

Scatter graphs.</td><td>39.The times taken for students to complete two questions were recorded as:

<table><tr><th>Time (t minutes)</th><th>No of students</th></tr><tr><td>$0 < t \leq 20$</td><td>3</td></tr><tr><td>$21 < t \leq 25$</td><td>12</td></tr><tr><td>$26 < t \leq 30$</td><td>25</td></tr><tr><td>$31 < t \leq 35$</td><td>49</td></tr><tr><td>$36 < t \leq 40$</td><td>21</td></tr><tr><td>$41 < t \leq 45$</td><td>7</td></tr><tr><td>$46 < t \leq 50$</td><td>3</td></tr></table>
Draw a cumulative frequency table to illustrate this information.</td></tr>
<tr><td></td><td>Interpreting data</td><td>Find the range of a set of data.

Find averages using mean, median and mode.

Using cumulative frequency curves to find the median, upper and lower quartiles and interquartile range of a set of data

Box and Whisker diagrams</td><td>40. Draw a cumulative frequency curve for the information in question 39 and use it to find the median and inter quartile range of the data.

41. The annual salaries of employees in a small company are £45,000, £25,000, £15,000, £15,000 and £12,000. Find the mean, mode, median and range of this set of data.</td></tr>
<tr><td></td><td>Probability</td><td>Outcomes of a combination of 2 experiments.

Using tree diagrams and sample space diagrams</td><td>42. A fair 6 sided die and a 10p coin are tossed simultaneously. Complete the sample space diagram to show all the possible outcomes.

<table><tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>H</td><td>H,1</td><td>H,2</td><td></td><td></td><td></td><td></td></tr><tr><td>T</td><td>T,1</td><td></td><td></td><td></td><td></td><td></td></tr></table>
(a) What is the probability of throwing a tail and an odd number?
(b) What is the probability of throwing a head
or a number greater than 4</td></tr>
</table>

Answers to Sample Questions

1. 300,206
2. a) 5.6
   b) 5.65
3. a) 0.6
   b) 60%
4. 30 %
5. 1/2
6. +5
7. –7
8. +33
9. –9
10. £140 : £160
11. (a) 6.34×10^3
    (b) 7.62×10^{-4}
12. 1.8×10^{-4}
13. 5.55×10^{-5}
    7.22×10^{-5}
    $\times 10^2$
    8.17×10^3
    5.27×10^5
14. 2 x 2 x 2 x 3
15. 4
16. 3^2
17. x – y
18. (a) 3d (3c + 4e)
    (b) ab^2 (3 – ab)
    (c) (x – 4)(x + 3)
19. $2x^2 – x – 15$
20. (a) $2x^3$
    (b) $6x^5$
    (c) $27x^6$
21. $s = \frac{g - t^2}{-r}$ or $s = \frac{t^2 - g}{r}$
22. (a) x = 3
    (b) x = 13
23. x = 5, y = 2
24. x = 5 or x = -3
25. x = 3.36
26. (a) $x \leq 6$
    (b) $x \leq -4$ or $x \geq 4$
27. (a) 17, 3n – 1
    (b) 30, $n^2 – n$
28. (-1,-3)
29. x = +2.2 and x = -2.2
30. x = 2, y = 1
31. (a) A' (-2,1), B' (0,1), C' (0,-1), D' (2,-1), E' (2,-3), F' (-2,-3)
    (b) A'' (8,4), B'' (7,4), C'' (7,3), D''(6,3), E'' (6,2), F'' (8,2)
    (c) A''' (-3,-1), B''' (-3,-2), C''' (-4,-2), D''' (-4,-3), E''' (-5,-3), F''' (-5,-1)
32. 126°
33. a = 108°, b= 59°, c = 59°, d = 49°, e = 108°
34. Area of square = 400 cm^2
    Area of circle = 314.16 cm^2
    Shaded area = 85.84 cm^2
35. 197.9 cm^2
36. 7.9 cm
37. AC = 10.72 cm, BC = 14.66 cm
38. 028°, 7.4 km
39.

Time (in mins)	Students	Cumulative Frequency
$0 < t \leq 20$	3	3
$21 < t \leq 25$	12	15
$26 < t \leq 30$	25	40
$31 < t \leq 35$	49	89
$36 < t \leq 40$	21	110
$41 < t \leq 45$	7	117
$46 < t \leq 50$	3	120

40. answers are approximate:
    median = 32
    upper quartile = 35
    lower quartile = 28
    interquartile range = 7
41. mean = £22,400
    median = £15,000
    mode = £15,000
    range = £33,000
42.

	1	2	3	4	5	6
H	H,1	H,2	H,3	H,4	H,5	H,6
T	T,1	T,2	T,3	T,4	T,5	T,6

(a) $\frac{1}{4}$

(b) $\frac{2}{3}$

Edge Hill GCSE Maths Equivalency Test

Edge Hill University

Specimen Paper 1

2 Hours and 30 minutes

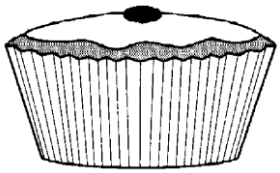
Name ……

ATTEMPT ALL QUESTIONS

- Show all your working in the space provided and make sure your answer is clear.
- It is assumed that you have a scientific calculator, ruler and protractor.
- If your calculator does not have a π button, take the value of π to be 3.142
- Diagrams are not necessarily drawn to scale.
- The marks for each question are given in brackets by the side of the question.
- Marks may be given for method even if your answer is wrong.
- The total marks available are 120

Calculator Questions

1. A cake is made from fat, flour and sugar



The cake weighs 110g
The weight of the sugar is 42g

(a)(i) What percentage of the weight is sugar?
Give your answer correct to one decimal place.

……

……

…… [2]

(ii) The ratio of the weight of flour to the weight of sugar is 3 : 2.
What is the weight of the flour?

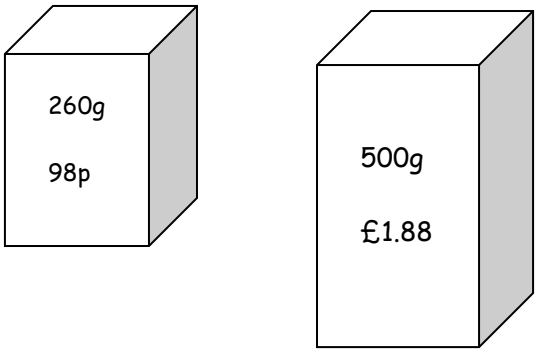
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2. Two packets of cereal are priced as shown.
Which packet represents the best value? You **must** show your working clearly.



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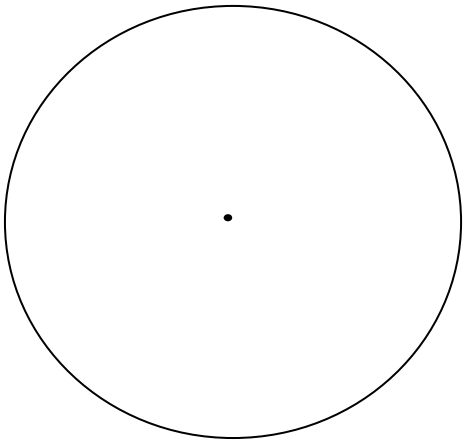
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…… [2]

3. One Saturday a newsagent sells the following:

National daily newspapers	510
Echo	360
Magazines and comics	210

Draw a clearly labelled pie chart to represent these sales.



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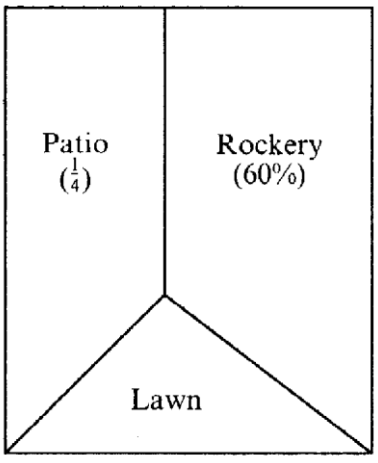
…… [3]

4. The diagram illustrates a garden.

60% of the garden is a rockery.

$\frac{1}{4}$ of the garden is a patio.

What percentage of the garden is lawn?



……

……

……

…… [3]

5. (a) Light travels at 186,000 miles per second, to the nearest thousand miles.
Write this number in standard form.

…… [2]

(b) The planet Jupiter is 486.6 million miles from the sun.
Calculate how long the light takes to travel from the sun to Jupiter.
Give your answer to the nearest minute.

……

……

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…… [3]

6. Mrs Jones earns £21,000 per annum. Her annual pay rise this year is 3%. What will her new salary be?

……

……

…… [2]

7. Darren drives 38km at an average speed of 63km per hour

Calculate how long his journey takes. Give your answer in minutes.

……

……

…… [2]

8. The volume of a sphere is given by the formula $V = \frac{4}{3}\pi r^3$

(a) Rearrange the formula to give r in terms of V.

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…… [2]

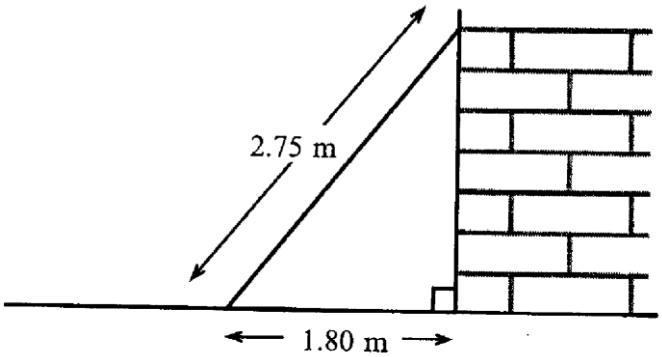
(b) Find the value of r when V = 75 cm^3

……

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…… [2]

9. A ladder, 2.75m long leans against a wall.
The bottom of the ladder is 1.80m from the wall, on level ground.



Calculate how far the ladder reaches up the wall.
Give your answer to an appropriate degree of accuracy.

……

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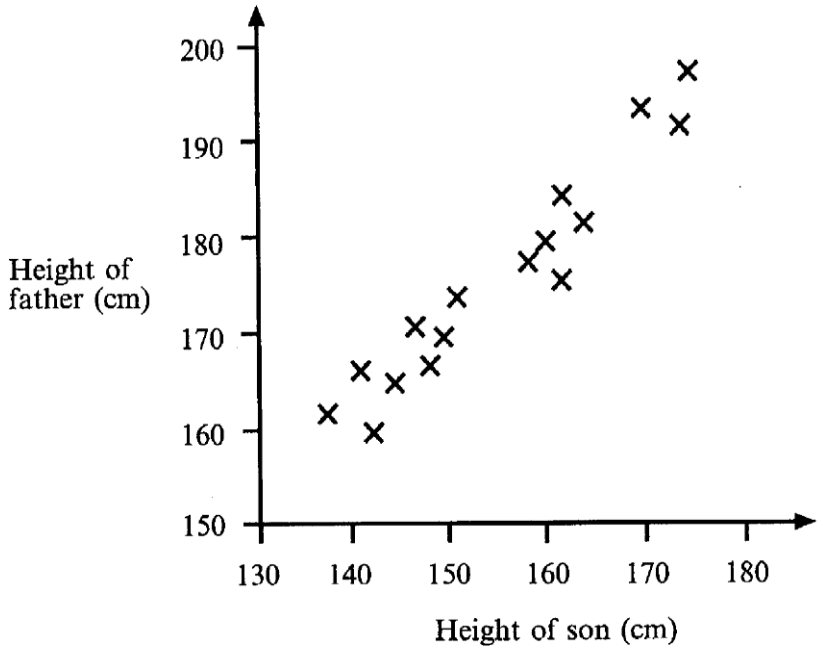
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…… [3]

10. The scatter diagram shows the heights of sixteen Year 9 boys and their fathers.



(a) What does the scatter diagram tell you about the relationship between the heights of these boys and their fathers?

……

……

…… [1]

(b) Draw a line of best fit on the diagram. [1]

(c) Bill, another Year 9 boy, is 155cm tall.
Use the diagram to estimate the height of Bill's father.
Show clearly how you obtained your answer.

……

……

…… [2]

11. Given that $y = x^2 + 1$

(a) Complete the table below,

x	0	1	2	3	4	5	6
y				10			37

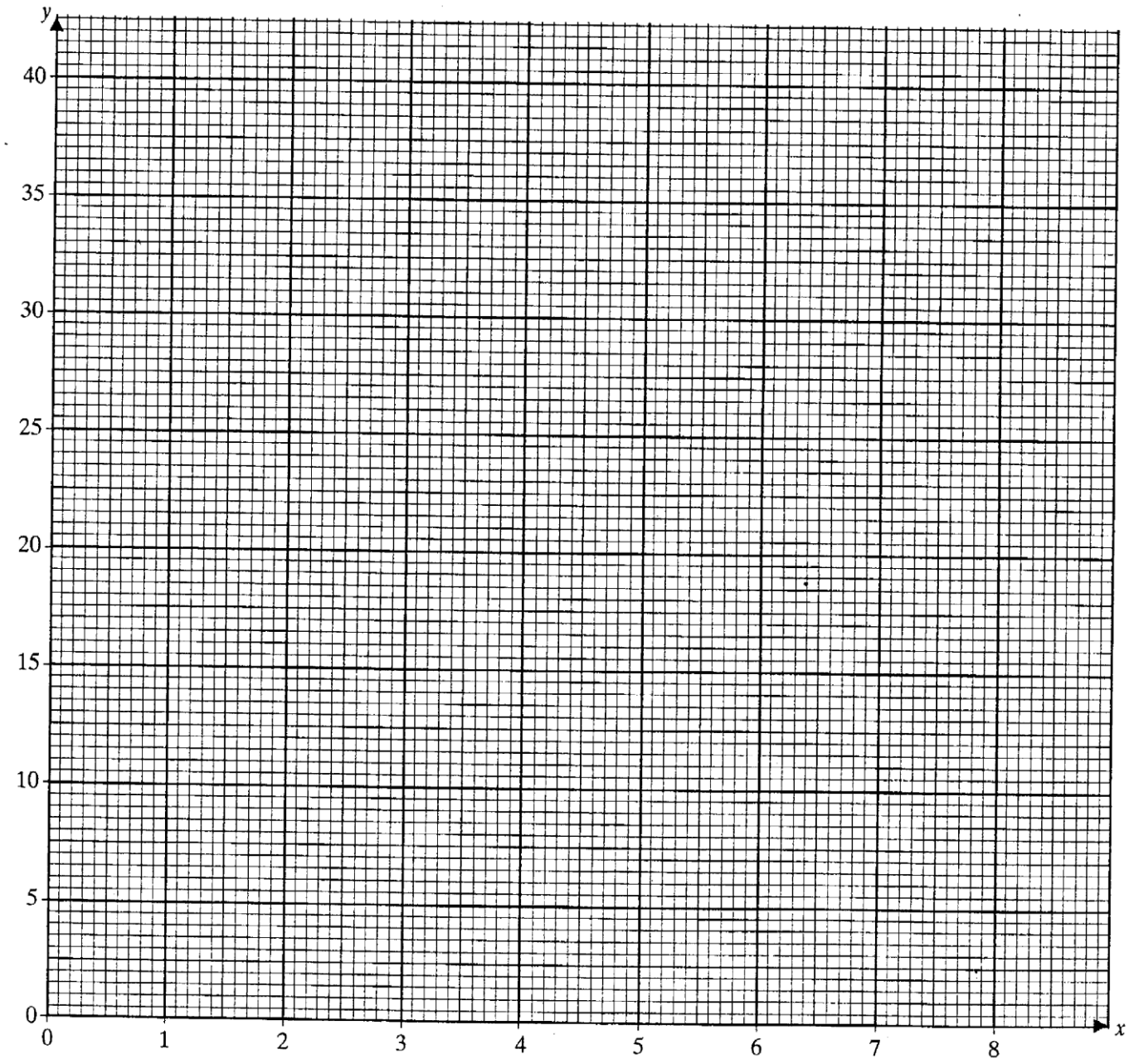
[2]

(b) Plot these points on the grid below and hence draw the graph of $y = x^2 + 1$

[2]

(c) Use your graph to find the value of x when y = 30

…… [1]

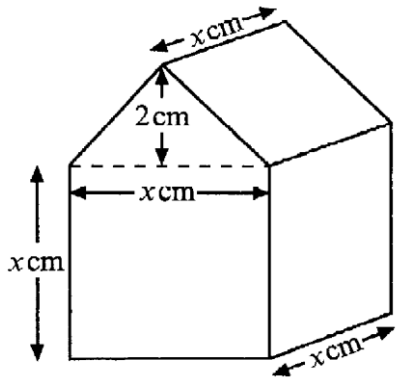


12. (a) Use trial and improvement to solve the equation $x^3 + x^2 = 500$
One trial has been completed for you.
Show all your trials.
Give your answer correct to 1 decimal place.

x	$x^3 + x^2$	
7	$7^3 + 7^2 = 392$	Too small

…… [4]

(b) A company makes cartons for fruit juice



Each carton is a pentagonal prism as shown.
The cross section of the prism is formed from a square and an isosceles triangle.
The perpendicular height of the triangle is 2cm and the base of the triangle is x cm.
The prism is x cm long.

(i) Show that the volume of the carton , V cm^3 is given by the formula

$$V = x^3 + x^2$$

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…… [3]

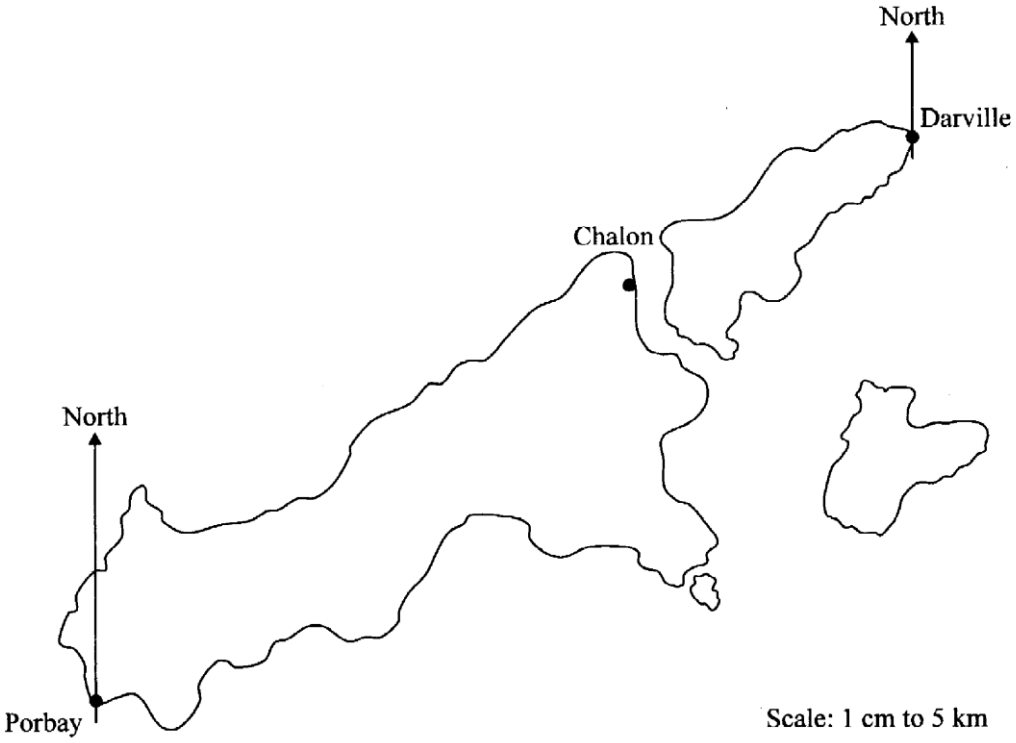
(ii) The volume of the carton is 500 cm^3.

Use your answer to part (a) to find the height of the carton

……

…… [1]

13. The diagram shows a map of a group of islands.
The map has been drawn to a scale of 1cm to 5km.



(a) A straight road joins Porbay to Chalon.

(i) Use the map to find the length of this road in kilometres.

.....

.....

..... [2]

(ii) Brian cycles to Porbay along this road.
He sets off at 0930 and cycles at an average speed of 18km per hour.
At what time does he arrive in Chalon?

.....

.....

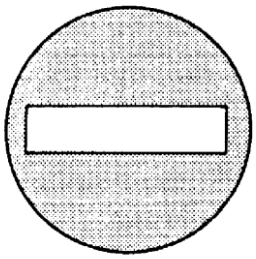
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..... [2]

(b) A lighthouse is on a bearing of 080° from Porbay and 200° from Darville.
Mark, with a cross, the position of the light house on the map.

[3]

14. The diagram shows a 'No Entry' sign which has a radius of 35 cm.



If the white rectangle measures 60 cm by 10 cm, find the area of the sign that is painted red. Give your answer to a reasonable degree of accuracy.

……

……

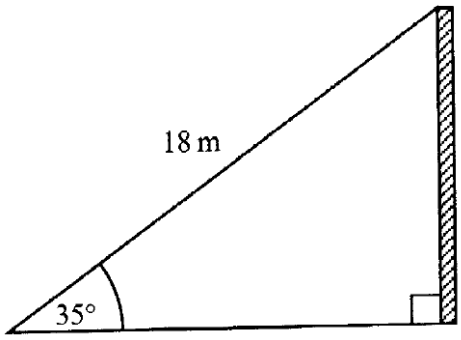
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…… [4]

15. A wire 18cm long runs from the top of a pole to the ground as shown in the diagram. The wire makes an angle of 35° with the ground.



Calculate the height of the pole.
Give your answer to a suitable degree of accuracy.

……

……

……

…… [4]

16. (a) Factorise completely $3a^2 - 6a$

……. [2]

(b) Multiply out and simplify $(2x - 1)(x - 3)$

……

……

……

……. [3]

17. Look at this number pattern.

$$7^2 = 49$$
$$67^2 = 4489$$
$$667^2 = 444889$$
$$6667^2 = 44448889$$

The pattern continues.

(a) Write down the next line of the pattern.

……. [2]

(b) Use the pattern to work out 6666667^2

……

……. [1]

(c) What is the square root of 4444444488888889?

……

……. [2]

18. (a) Find the next two terms in the sequence:

3, 8, 13, 18, 23, …, …, …

……

……. [1]

(b) Write down the n^{th} term of the sequence:

……

……

……

…… [2]

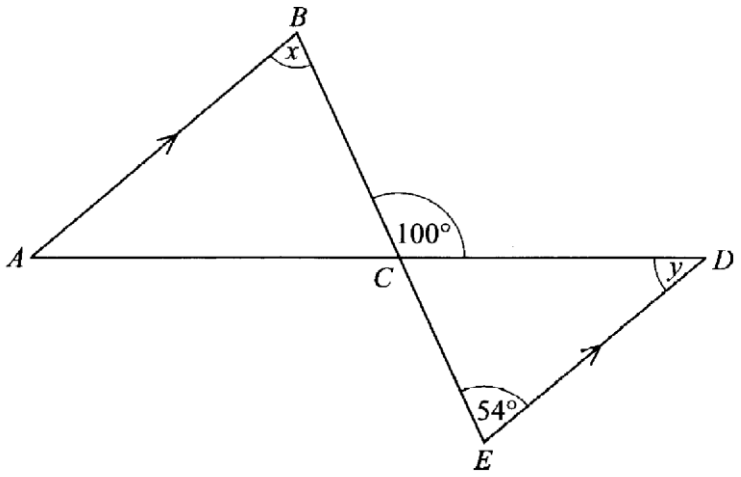
(c) What would be the 100^{th} term in the sequence?

……

……

…… [1]

19. In the diagram, AB is parallel to ED. Angle CED = 54° and angle BCD = 100°.



not to scale

(a) (i) Write down the size of angle x

…… [1]

(ii) Find the size of angle y

……

…… [2]

(b) Triangle ABC is similar to triangle DEC.
AC:CD is 3:2
AB = 5.4 cm

Calculate the length of DE.

……

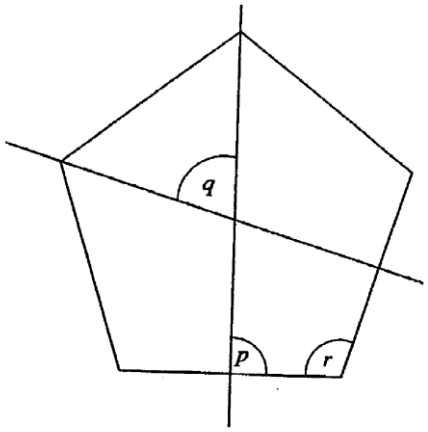
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……

……

…… [3]

20. The diagram represents a regular pentagon with two of its lines of symmetry shown.



(a) Write down the size of angle p.

…… [1]

(b) Calculate the size of angle q

……

……

…… [2]

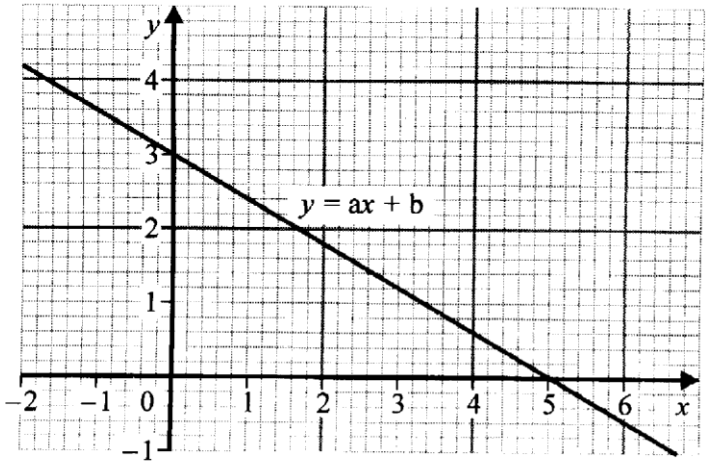
(c) Calculate the size of angle r

……

……

…… [2]

21. A graph of the equation $y = ax + b$ is shown.



Find the values of a and b.

……

……

…… [3]

22. (a) Solve the equation

$3x - 2 = x + 7$

……

……

…… [2]

(b) Solve the simultaneous equations

$x + y = 4$

$15x + 25y = 76$

……

……

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…… [3]

(c) Solve the inequality

$$2 (3x - 2) < 11$$

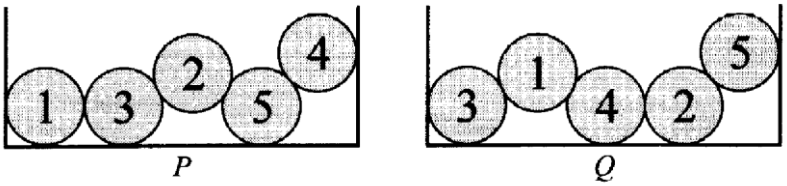
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…… [2]

23. Boxes P and Q each contain five numbered balls.
The balls in each box are numbered as shown.



A ball is taken from each box at random.

(a) What is the probability that both balls are numbered 2?

……

……

…… [2]

(b) What is the probability that both balls have the same number?

……

……

…… [2]

(c) What is the probability that the number on the ball from box P is greater than the number on the ball from box Q?

……

……

…… [2]

24. (a) Write down a decimal that lies between $\frac{1}{3}$ and $\frac{1}{2}$

…… [1]

(b) Which of these two fractions is the bigger?

$\frac{3}{4}$ or $\frac{2}{3}$

Show your working

……

……

…… [2]

25. An examiner marked 320 examination papers.
He noted the time it took to mark each one.
The table gives a summary of these times.

Time, t minutes	Frequency	Cumulative frequency
$0 < t \leq 2$	15	
$2 < t \leq 4$	85	
$4 < t \leq 6$	170	
$6 < t \leq 8$	40	
$8 < t \leq 10$	10	

(a) (i) Complete the table by filling in the cumulative frequencies.

[2]

(ii) On the grid opposite, draw a cumulative frequency diagram to show this information

[2]

(b) Making your method clear, use your diagram to find

(i) the median time taken to mark each paper

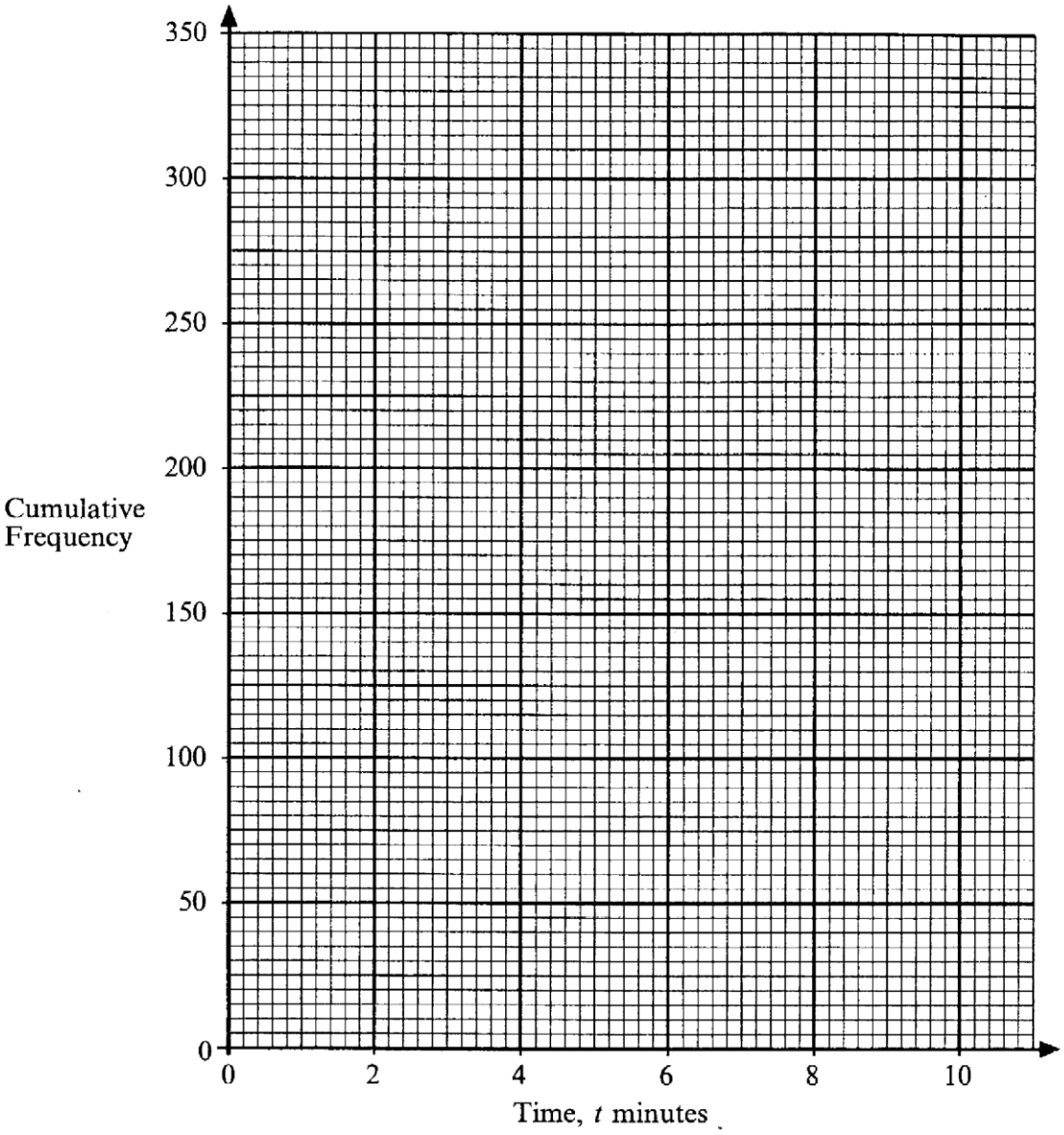
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…… [2]

(ii) the inter-quartile range of the times taken

……

…… [2]



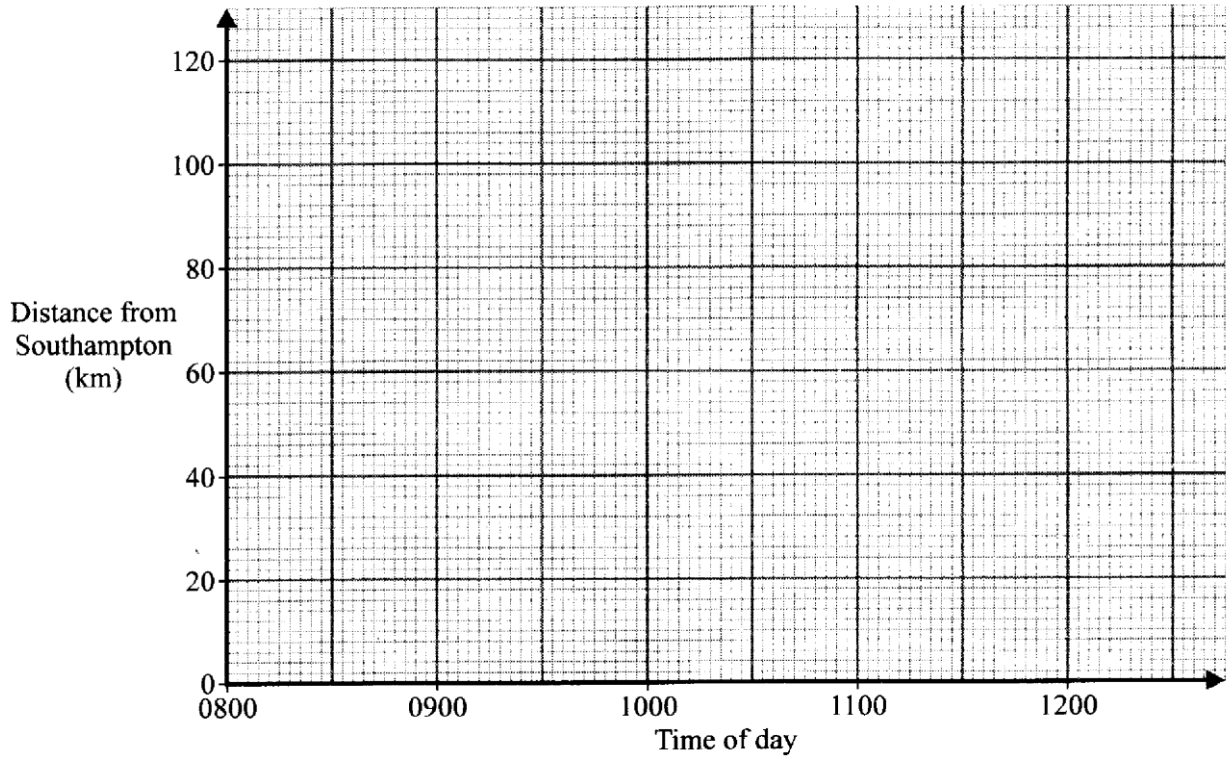
26. The distance between Southampton and London is 120km.

A coach leaves Southampton at 0800 to travel to London.

The coach travels 60 km at an average speed of 80 km per hour and then stops for 30 minutes. It then continues its journey arriving in London at 1100.

At 1115 the coach leaves London and returns to Southampton without stopping. It arrives in Southampton at 1230.

(a) Draw a travel graph for the journey of the coach.



[3]

(b) What was the average speed of the coach on the return journey?

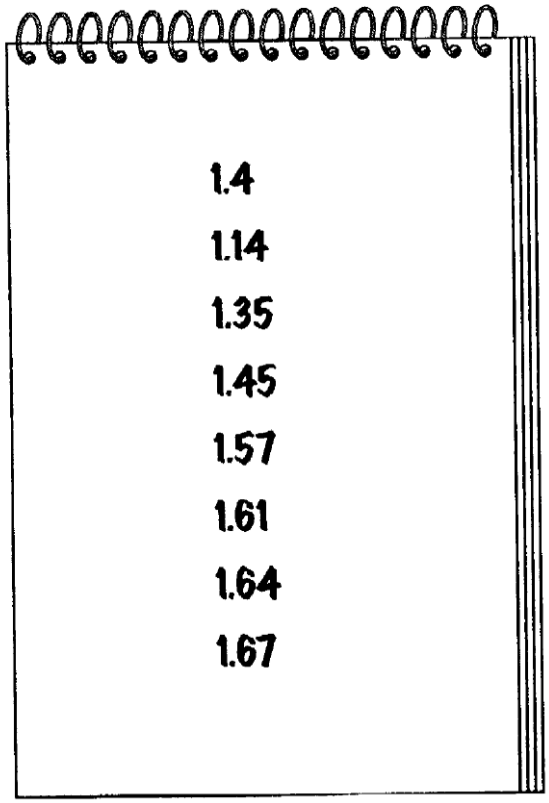
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..... [2]

27.



A pupil measures the height in metres of the girls in her class.

She writes these heights in order of size as shown above. One of the heights is in the wrong place.

(a) Put a ring round the height that is in the wrong place.

[1]

(b) Calculate the mean height of the girls.

……

……

……

…… [2]

(Total marks 120)

END OF EXAM

Answers to Specimen Paper 1

Answers to questions involving diagrams of graphs may vary slightly

1.(a)(i) 38.2% (ii) 63g	21. a=3/5, b=3
2.The 260g box gives 265.30612g per £ so It is better value	22. (a) x= 4.5, (b) x=2.4, y=1.6 (c) x<2.5
3.Pie chart with angles 170^0,120^0 , 70^0	23. (a) $\frac{1}{25}$, (b) $\frac{1}{5}$, (c) $\frac{2}{5}$
4. 15%	24. (a) any decimal between 0.33333 and 0.5 (b) ¾ is bigger
5(a) 1.86 x 10^5 (b) 44 mins	25. (a) (i) 15, 100,270,310,320 (ii) on diagram (b) (i) 4.6 minutes (ii) 1.8 minutes
6. £21,630	
7. 36 minutes	26. (a) On graph (b) 96 km per hour
8.a) $r=\sqrt[3]{\frac{3V}{4\pi}}$ b)2.62cm	27. (a) 1.4 (b) 1.48m
9. 2.10m to 2dps	
10. There is a good positive correlation – the taller the father the taller the son.	
11.(a) 1,2,5,17,26, (b) On graph, (c) 5.4	
12.(a) 7.6 (b)(i) Area of triangle = x, Area of square = x^2, Area of cross section = $x^2 + x$, Volume of prism = $x(x^2 + x) = x^3 + x$ (b)(ii) 7.6cm	
13.(a)(i)45km, (ii)1200 (b) On map.	
14. 3248cm^2	
15.10.32m	
16 (a) 3a(a-2) (b). 2x2 – 7x + 4	
17. (a) $66667^2 = 4444488889$ (b) 44444448888889 (c) 66666667	
18. (a) 28, 33 (b)5n-2, (c)498	
19. (a)(i) 54^0 (ii) 46^0 (b)3.6cm	
20.(a) 90^0 (b) 72^0 (c)108^0	

Edge Hill GCSE Maths Equivalency Test

Edge Hill University

Specimen Paper 2

2 Hours and 30 minutes

Name .....

ATTEMPT ALL QUESTIONS

- Show all your working in the space provided and make sure your answer is clear.
- It is assumed that you have a scientific calculator, ruler and protractor.
- If your calculator does not have a π button, take the value of π to be 3.142
- Diagrams are not necessarily drawn to scale.
- The marks for each question are given in brackets by the side of the question.
- Marks may be given for method even if your answer is wrong.
- The total marks available are 120

Calculator Questions

1. An Athletics stadium has 35,000 seats.
4% of the seats are fitted with headphones to help people hear the announcements.
How many headphones are there in the stadium?

……

……

……

…… [2]

2. Use a calculator to find the value of

(a) $\frac{3.86 + 17.59}{5}$ …… [1]

(b) $\frac{9.76 + 1.87}{18.3 - 15.8}$ …… [1]

(c) $\frac{330}{1.2 \times 5.5}$ …… [1]

(d) $\frac{1}{\sqrt{(0.16)}}$ …… [1]

3. Louise does a sponsored bicycle ride.
Each wheel of her bicycle is of radius 25 cm.

(a) Calculate the circumference of one of the wheels

……

……

…… [2]

(b) She cycles 50km. How many revolutions does a wheel make during the sponsored ride? Give your answer to 3 significant figures.

……

……

……

…… [3]

4. In a sale a dress costs £28.90.
The original price has been reduced by 15%

What was the original price?

……

……

…… [2]

5. Katy is using trial and improvement to find an answer to the equation

$x^3 - x = 35$

The table shows her first two tries.

x	$x^3 - x$	Comment
3	**24**	**Too low**
4	**60**	**Too high**

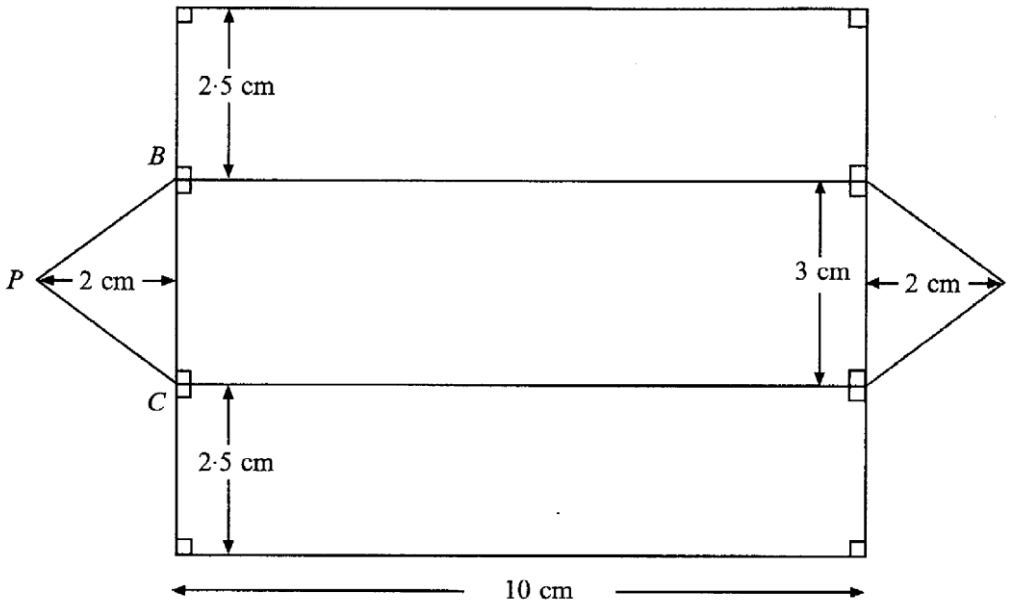
Continue the table to find a solution to the equation.

Give your answer correct to 1 decimal place.

……

…… [4]

6. This net will fold into a 3 dimensional shape.



(a) Calculate the area of the net. Remember to state the units in your answer.

……

……

……

…… [3]

(b) (i) Draw a sketch of the shape that the net makes when folded.

[2]

(ii) What is the mathematical name for this shape?

…… [1]

(c) Calculate the volume of this shape. State the units in your answer.

……

……

……

…… [3]

7. On a computer keyboard there are 104 keys

(a) 26 of the keys have letters on them
What fraction of the keys have letters on them? Give your answer in its simplest form.

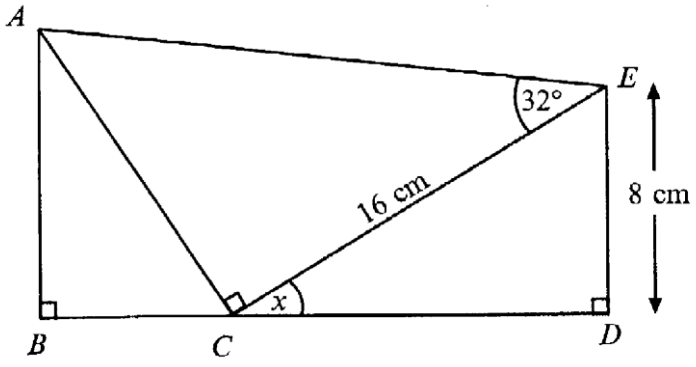
…… [2]

(b) 13 of the keys have arrows on them.
What percentage of the keys on the keyboard have arrows on them?

……

…… [2]

8.



the diagram is not drawn to scale

BCD is a straight line. CE = 16 cm

(a) Calculate the size of the angle marked x

……

……

……

……

…… [3]

(b) Calculate the length of AC

……

……

……

……

…… [2]

(c) Use your answers to parts (a) and (b) to calculate the length of BC

……

……

……

……

…… [3]

9. The contents of books and newspapers can be stored on microfilm.

ABCD is one rectangular frame of this microfilm.

AB = 4.5×10^{-3} centimetres and BC = 6.2×10^{-4} centimetres

(a) Calculate the area of the rectangle.
Give your answer in standard form. State the units in your answer.

……

……

……

…… [2]

(b) Calculate the perimeter of the rectangle.
Give your answer in standard form. State the units in your answer.

……

……

……

…… [2]

10. On a motorway there are three lanes, an inside lane, a middle lane and an outside lane.

On day, at midday, the speed of the traffic on these lanes was in the ration 3:4:5.

The speed on the outside lane was 70 miles per hour.
Calculate the speed on the inside lane.

……

……

……

…… [2]

11. When a model is fired in a kiln, the probability that it shrinks is 0.95.

When taken out to cool, the probability that it cracks is 0.04

(a) What is the probability that when a model is fired it does **not** shrink?

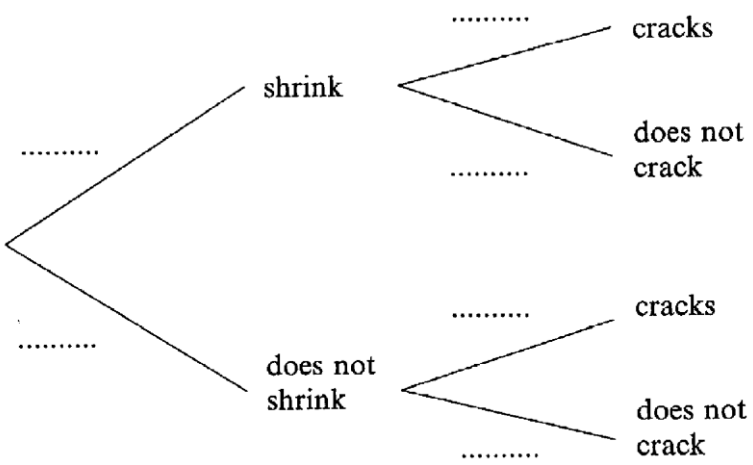
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…… [2]

(b) A model is fired in a kiln and then taken out to cool.
Complete the tree diagram
Write all the missing probabilities on the appropriate branches



[2]

(c) Calculate the probability that the model shrinks and also cracks.

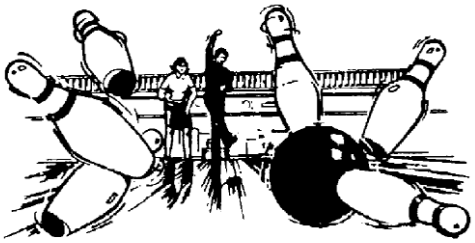
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…… [2]

12. Graham and Wendy go ten pin bowling.



(a) Graham's first eight scores are:

5, 8, 8, 5, 5, 6, 6, 5

What is his mean score?

……

……

…… [2]

(b) Wendy's first eight scores are:

5, 8, 2, 2, 9, 3, 2, 9

(i) What is her modal score?

……

…… [1]

(ii) What is the range for Wendy's scores?

……

…… [1]

(c) Who is the better bowler?

Give a reason for your answer.

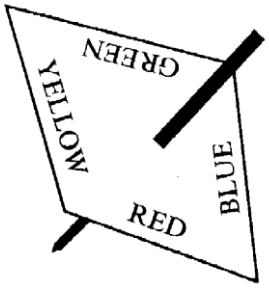
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…… [2]

13. The spinner shown is biased.



The probabilities of getting a particular colour are shown in the table below.

Colour	RED	YELLOW	BLUE	GREEN
Probability	0.4	0.1	0.3	

(a) Complete the table to show the probability of getting GREEN

[1]

(b) The spinner is spun once.
What is the probability of getting either RED or BLUE?

……

……

……

…… [2]

(c) The spinner is spun 50 times.
Approximately how many times would you expect to get RED?

……

……

…… [2]

14. Solve the simultaneous equations

$$2a + 4c = 13$$
$$a + 3c = 8$$

……

……

……

……

……

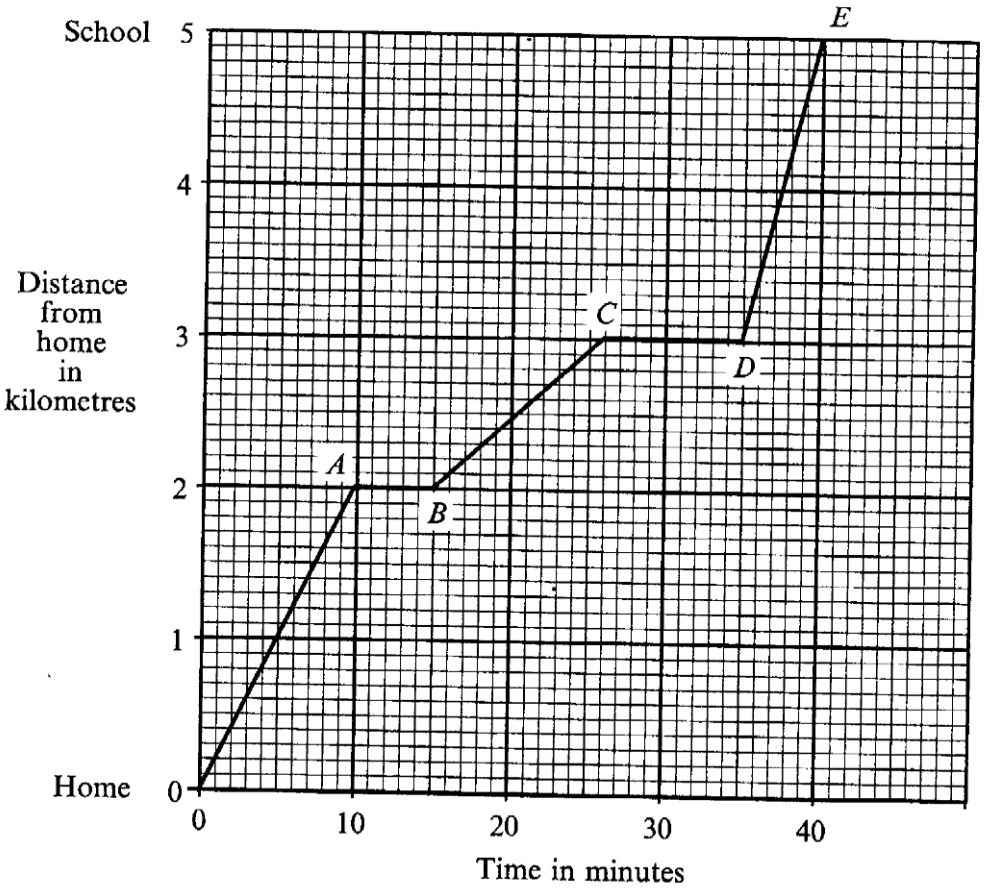
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…… [4]

15. Jenny cycles to school each day.

The graph shows her journey from home to school. On the way she stops to talk to her friends.



(a) How many times does she stop to talk to her friends?

…… [1]

(b)(i) How far does she travel in the first stage from home to A?

…… [1]

(ii) What is her average speed for the first 10 minutes?
Give your answer in kilometres per hour.

……

……

……

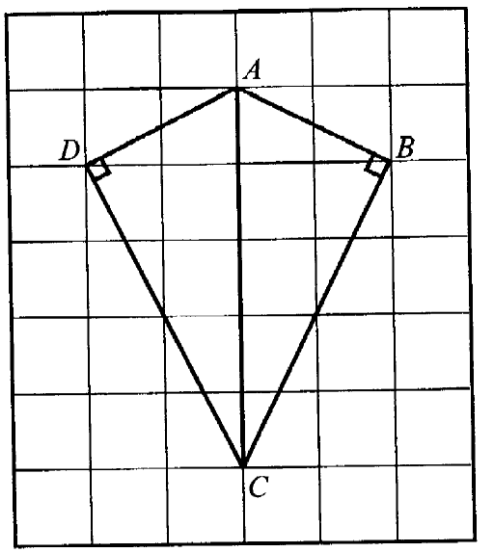
…… [2]

(c) On which stage of her journey is her average speed fastest?

……

…… [1]

16. Two right angled triangles are put together on a 1cm grid to make a kite.



(a) What is the area of the kite? Remember to state the units.

……

……

……

…… [2]

(b) Draw a sketch to show how the two triangles can be put together to make an isosceles triangle.

[2]

17. Write down the nth term for each of the following sequences.

(a) 3, 6, 9, 12

……

…… [1]

(b) 1, 4, 7, 10

……

…… [1]

(c) 1, 4, 9, 16

……

…… [2]

(d) 4, 16, 36, 64

……

…… [2]

18. (a) Expand $x(3x^2 - 5)$

……

……

…… [2]

(b) Expand and simplify $(2x + 1)(3x - 2)$

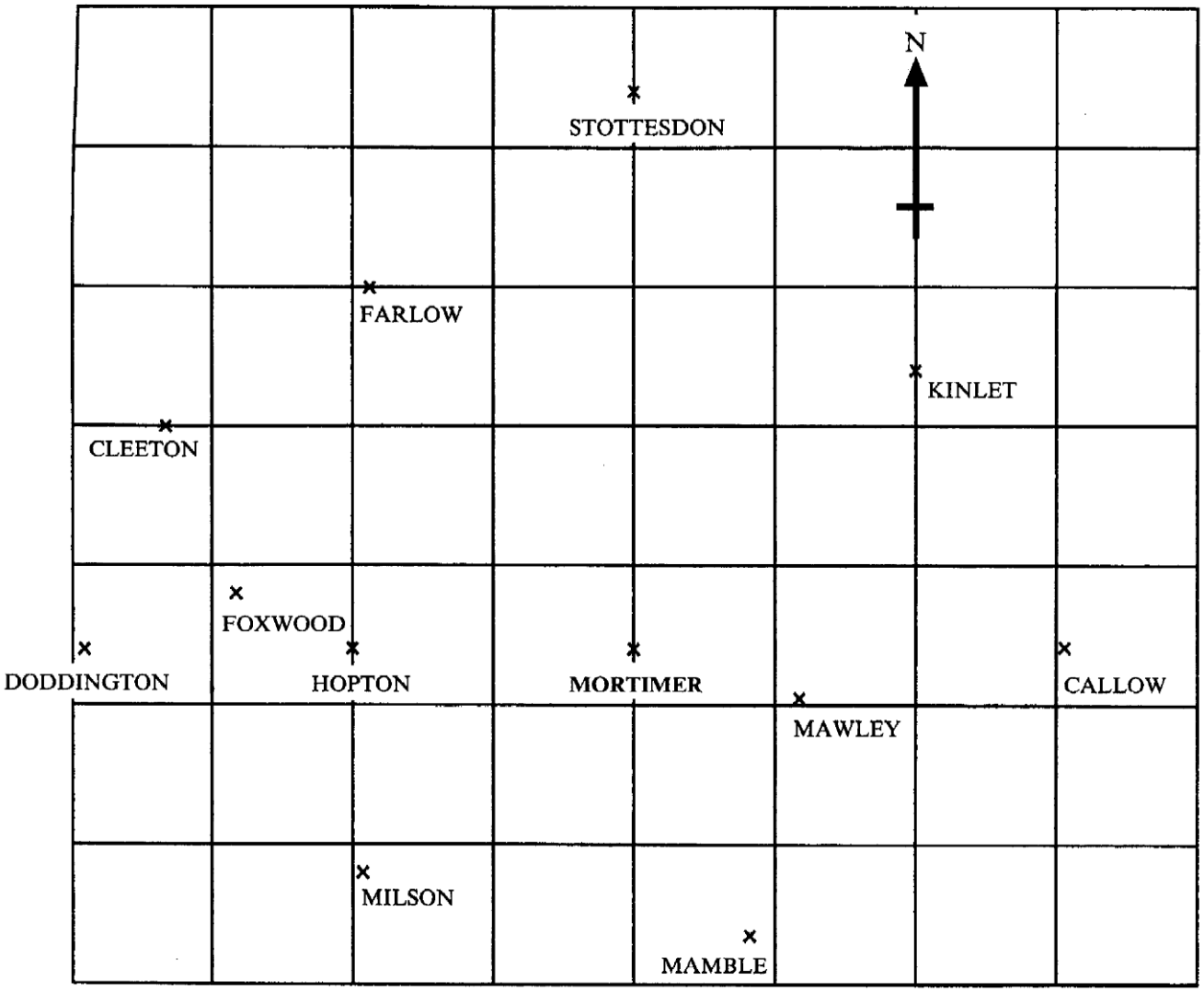
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…… [3]

19. The map shows part of Shropshire.



(a) What is the bearing of Cleeton from Mortimer?

.....

..... [2]

(b) Which town is on a bearing of 011° from Mamble?

.....

..... [2]

20. The table shows the mathematics test results for 90 students.
The test was marked out of 60.

Mark (x)	Frequency	Cumulative Frequency
$0 \leq x \leq 10$	12	12
$10 < x \leq 20$	15	
$20 < x \leq 30$	29	
$30 < x \leq 40$	16	
$40 < x \leq 50$	11	
$50 < x \leq 60$	7	

(a) Complete the cumulative frequency column

[1]

(b) Draw a cumulative frequency diagram on the grid opposite

[3]

(c) Use your diagram to estimate

(i) the median

……

…… [2]

(ii) the interquartile range

……

……

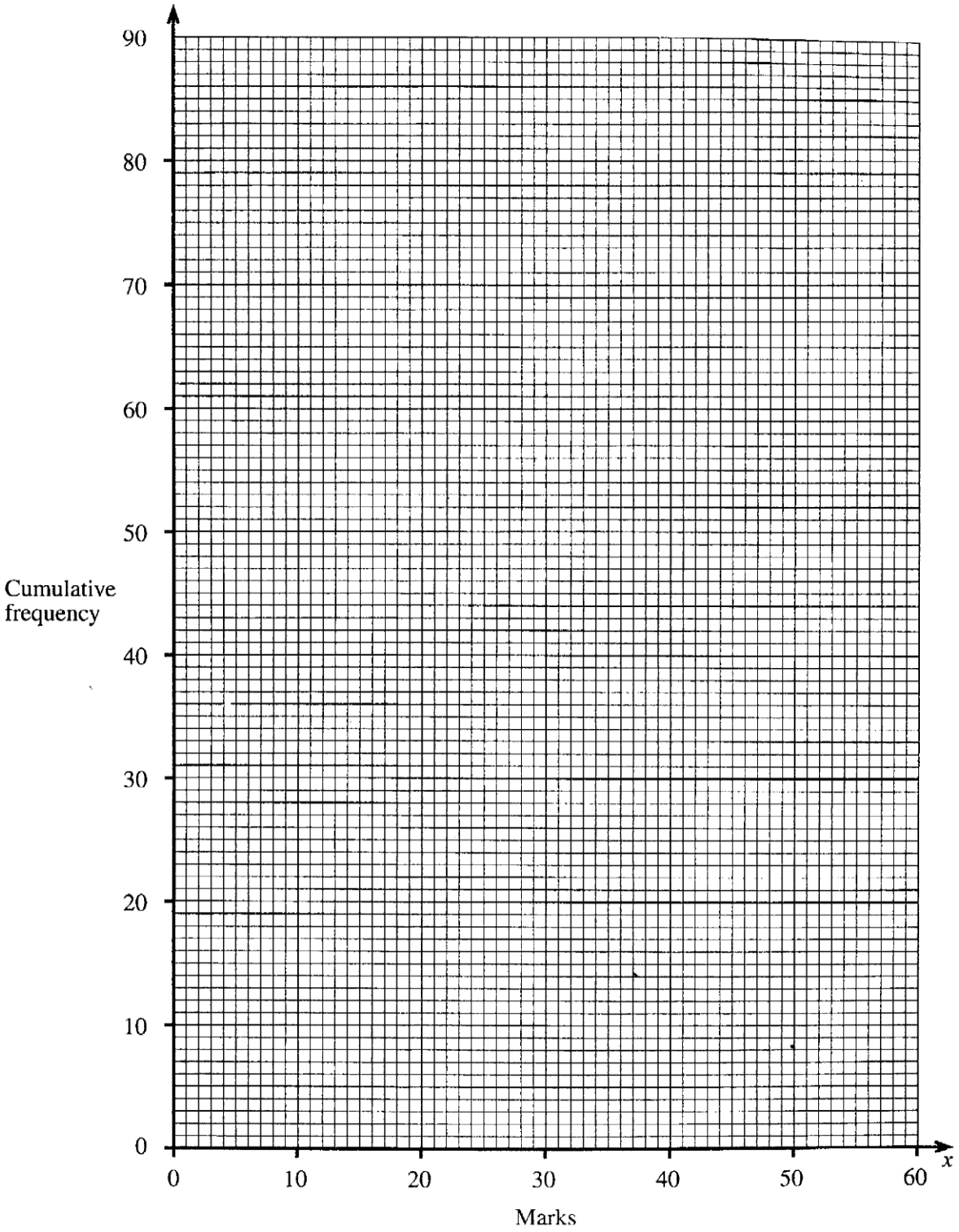
…… [2]

(d) The pass mark for the test is 25 marks.
Use your graph to estimate how many pupils pass the test.

……

……

…… [2]


90
80
70
60
50
Cumulative frequency
40
30
20
10
0
0
10
20
30
40
50
60
x
Marks

21.

3, 9, 20, 25, 29, 75, 92, 100

Which of the numbers in the box are

(a) square numbers?

…… [2]

(b) factors of 100?

…… [2]

(c) prime numbers?

…… [2]

22. (a) Factorise completely

$3x^2 - 6x$

……

…… [2]

(b) Make **t** the subject of the formula.

$$W = \frac{5t + 3}{4}$$

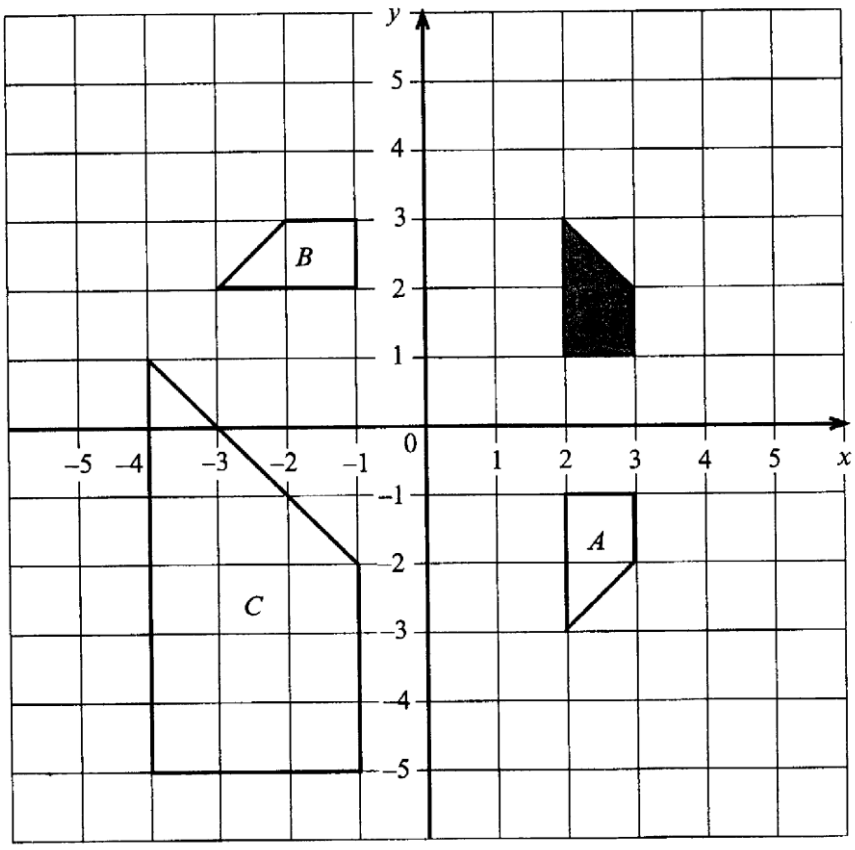
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…… [2]

23.



Describe fully a single transformation that would map the shaded shape onto

(a) shape A

……

……

…… [2]

(b) shape B

……

……

…… [3]

(c) shape C

……

……

…… [2]

24. Solve the equations

(a) $2x + 10 = 29$

……

……

……

…… [2]

(b) $5x - 4 = 8 - x$

……

……

……

…… [2]

(Total marks 120)

END OF EXAM

Answers to Specimen Paper 2

Answers to questions involving diagrams or graphs may vary slightly.

1. 1400	18. (a) $3x^3 - 5x$, (b) $6x^2-x-2$
2. (a) 4.29, (b) 4.652, (c) 50, (d)2.5	19. (a) 295^0, (b)Mawley
3. (a) 157.1cm, (b) 31800	20. (a) 27, 56, 72, 83, 90, (b) on diagram, (c)(i)27, (ii) 20, (d) 53
4. £34	21. (a) 9, 25, 100, (b) 20, 25, 100 (c) 3, 29
5. 3.4	22. (a) 3x(x-2), (b) $t = \frac{4W - 3}{5}$
6. (a) 86cm^2, (b) (i) diagram (ii) triangular prism (c) 30cm^3	23. (a) Reflection in the line y = 0 (i.e. x axis) (b) Rotation through 90^0 in an anticlockwise direction. The centre of the rotation is (0,0) (c) Enlargement, scale factor 3, centre of enlargement at (5,4)
7. (a) ¼, (b) 12.5%	
8. (a) 30^0, (b) 9.997cm, (c) 4.95cm	
9. (a) 2.79×10^{-6}, (b)1.024×10^{-2}	24. (a) x=9.5, (b) x=2
10. 42mph	
11.(a) 0.05, (b) 1st column 0.95, 0.05, 2nd column 0.04, 0.96, 0.04, 0.96. (c) 0.038	
12. (a) 6, (b)(i)2 (ii)7, (c) different answers, (d) Graham – he has a higher mean score OR, the smaller range means that he is more consistent.	
13. (a)0.2, (b)0.7, (c)20	
14. $a = 3\frac{1}{2}$, $c = 1\frac{1}{2}$	
15. (a) twice, (b)(i) 2km, (b)(ii) 12km per hour, (c) D to E	
16.(a) 10cm^2, (b) Diagram	
17. (a) 3n, (b) 3n-2, (c) n^2, (d)$3n^2$	

PAST PAPER 1

Edge Hill University

Special Examination in Mathematics for Mature Applicants to Teacher Training

Test Paper 1
2001

Two and a half hours

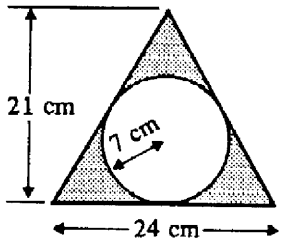
Name ……

ATTEMPT ALL QUESTIONS

- Show all your working in the space provided and make sure your answer is clear.
- It is assumed that you have a scientific calculator, ruler and protractor.
- If your calculator does not have a π button, take the value of π to be 3.142
- Diagrams are not necessarily drawn to scale.
- The marks for each question are given in brackets by the side of the question.
- Marks may be given for method even if your answer is wrong.
- The total marks available are 120.

Calculator Questions

1. A circle is drawn inside a triangle as shown.



(a) Calculate the area of the triangle

……

……

……

…… [2]

(b) Calculate the size of the shaded area

……

……

……

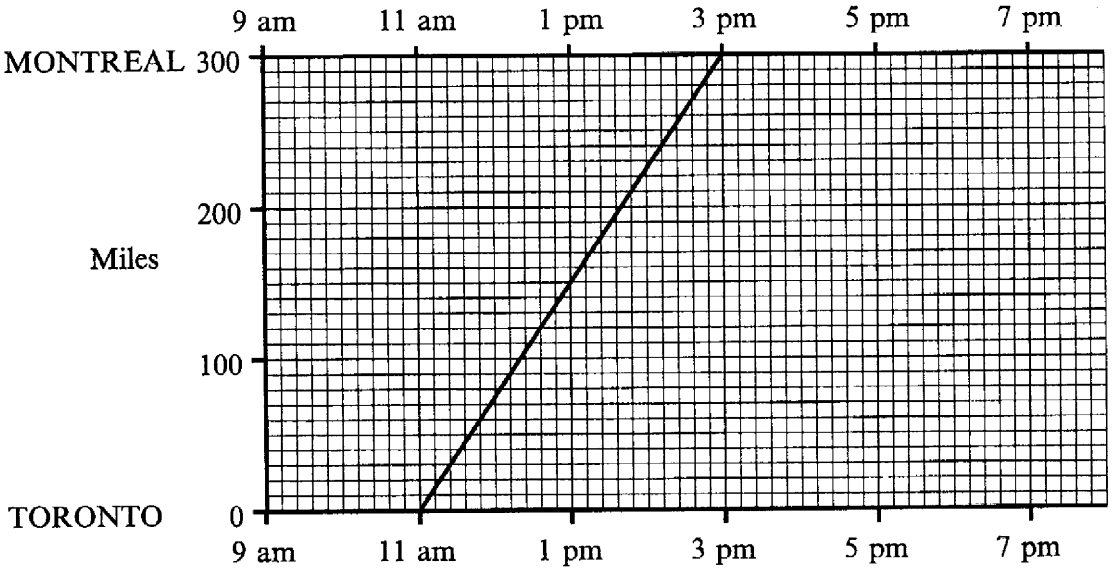
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…… [3]

2. **Every hour**, on the hour, a train leaves Toronto for Montreal.
At the same times, trains leave Montreal for Toronto.
All trains travel at a speed of 75 mph.
The distance between Toronto and Montreal is 300 miles.

(a) On the grid (on the next page), draw the distance time graphs of the trains.
(One of the distance time graphs has been drawn for you)



[2]

(b) Use your graphs to find

(i) when the 2 pm train from Toronto passes the 1pm train from Montreal

……

…… [1]

(ii) how many trains will be passed by the train leaving Toronto at 12 noon on its run to Montreal.

……

…… [2]

3. Jane conducted a survey about what her neighbours did on bonfire night. Her results are summarised in the table below.

Stayed at home	37
Went to the park	83
Went to a friend's house	42
Went to the cinema	3
Didn't reply	15
Total	180

Jane was asked to draw a pie chart to illustrate these results.
What angle should she use for 'Went to the park'?

……

……

……

……

…… [3]

4. In a general election, a candidate loses her/his deposit if s/he does not get at least 5% of the total votes cast.
Mary Ashworth, John Barnard and Bill Crowther are the only three candidates in the General Election in Bradworth.

5235 people voted for John Barnard
425 people voted for Bill Crowther

Bill Crowther kept his deposit because he got 5% of all the total votes cast.
How many people voted for Mary Ashworth?

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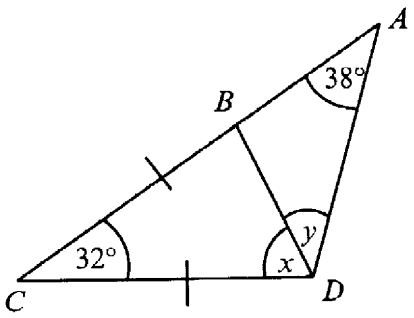
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…… [3]

5.



In the diagram CB = CD

(a) Calculate the size of the angle marked x

……

……

…… [2]

(b) Calculate the size of the angle marked y

……

……

…… [2]

(c) Does AB = BD?
Give as reason for your answer

……

……

…… [1]

6. One afternoon a survey was taken of 100 customers at a supermarket.
The time they spent queuing at the checkout was recorded.
The results are shown below.

Time t minutes	Number of customers
$0 < t \leq 5$	18
$5 < t \leq 10$	42
$10 < t \leq 15$	30
$15 < t \leq 20$	8
$20 < t \leq 25$	2

Calculate an estimate of the mean time the customers had to queue.

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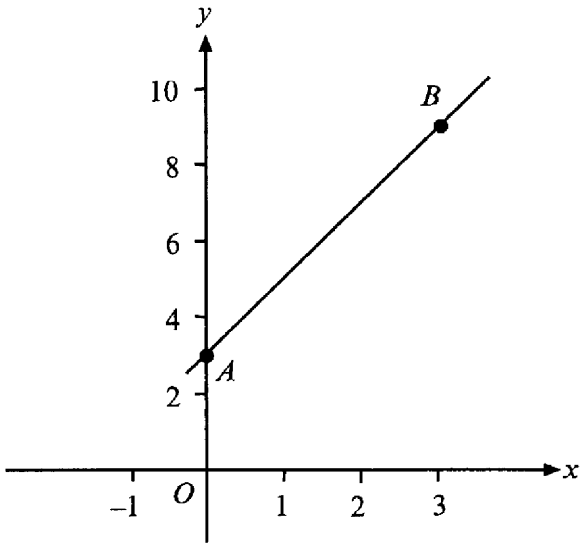
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7.



A is the point (0,3) and B is the point (3,9).

(a) Calculate the gradient of the line AB

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…… [2]

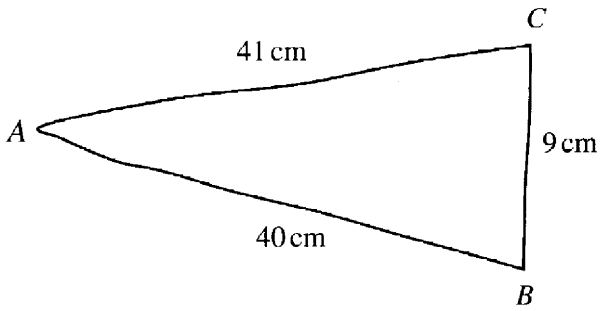
(b) Write down the equation of the line AB

……

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…… [2]

8. The sketch shows triangle ABC.
AB = 40cm, AC = 41cm and CB = 9cm



Not drawn accurately

By calculation, show that triangle ABC is a right angled triangle.

……

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…… [2]

9.(a) The distance from the earth to the moon is approximately 384,000 km.
Write this distance in standard form.

……

…… [2]

(b) Write these numbers in order, starting with the smallest:

8.17×10^3 **5.55×10^{-5}** **2.88×10^2** **7.22×10^{-5}** **5.27×10^5**

……

…… [2]

10. Use trial and improvement to solve the equation $x^3 - 2x = 30$
Two trials have been completed for you.
Show all your trials.
Give your answer correct to 1 decimal place.

X	$x^3 - 2x$	
3	$3^3 - 6 = 21$	Too small
4	$4^3 - 8 = 56$	Too big

[4]

11. A regular polygon has interior angles of 162°. How many sides has the polygon got? Show all your working.

……

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……

…… [3]

12. A formula is given as **v** = **u** + **at**

(a) Calculate v when **a** = 3, **t** = 1.5 and **u** = 2

……

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…… [1]

(b) Re-arrange the formula to make **a** the subject

……

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…… [2]

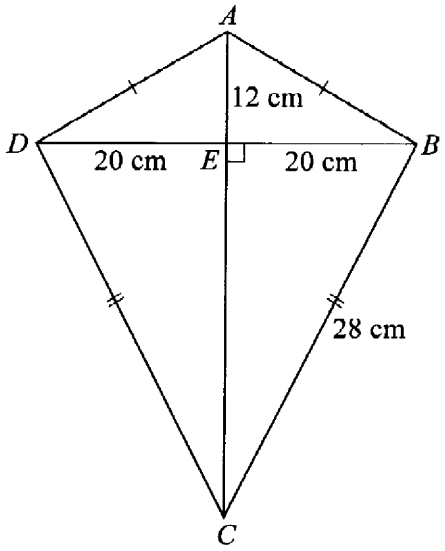
(c) Calculate **a** when **v** = 10, **u** = 3 and **t** = 5

……

……

…… [2]

13. The diagram shows a kite, ABCD.



Not to scale

AE = 12 cm, DE = EB =20 cm and BC = 28cm

(a) Calculate the size of angle EBC

……

……

……

……

……

…… [3]

(b) Calculate the length of EC and hence find the area of the kite.

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…… [5]

14(a) Write down a decimal that lies between $\frac{1}{5}$ and $\frac{1}{6}$.

…… [1]

(b) Which of these two fractions is the bigger?

$$\frac{3}{5} \quad \text{or} \quad \frac{2}{7}$$

Show your working

……

……

…… [2]

15. A child's hula hoop has a diameter of 80cm.

(a) What is the circumference of the hula hoop?

……

……

…… [2]

(b) Jenny pushed the hula hoop along a 20 m path. How many complete turns did the hula hoop make?

……

……

……

…… [2]

16.

1, 4, 5, 23, 25, 36, 41, 43, 45

Look at the numbers in the box above.

(a) Which of these numbers are multiples of 3?

…… [1]

(b) Which of these numbers are square numbers?

…… [1]

(c) Which of these numbers are prime numbers?

…… [1]

17. The probability that I am late for work on a Monday is 0.4
The probability that I am late for work on a Tuesday is 0.2

What is the probability that in one particular week

(a) I am late for work on both Monday and Tuesday

……

…… [2]

(b) I am late for work on Monday but on time on Tuesday

……

……

…… [2]

(c) I am on time both on Monday and on Tuesday

……

……

…… [2]

(d) I am late for work on Monday or Tuesday but not both days

……

……

…… [2]

18. The three angles of a triangle are given as x^o, $3x^o$ and $5x^o$.
Calculate the value of x.

……

……

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…… [3]

19. Factorise fully $5x^2 - 10x$

……

……

…… [2]

20. List the values of x, where x is a whole number, such that

$$-2 \leq x < 3$$

……

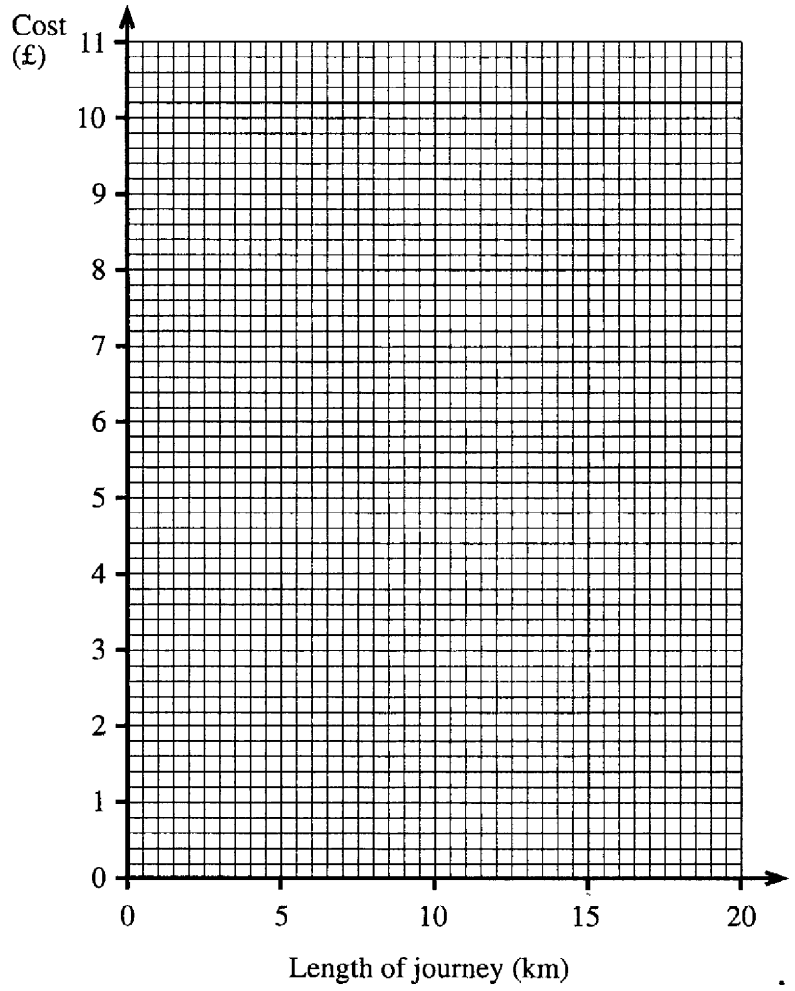
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…… [2]

21. These are the prices charged for different journeys by taxi.

Length of journey (km)	1	2	3	5	8	13	14	18
Cost (£)	1.80	2.30	2.50	2.80	5.40	7.50	8.40	10.30

(a) On the grid below, draw a scatter diagram to show this information.



[3]

(b) What does this diagram tell you about the relationship between the length of a journey and its cost?

……

…… [1]

(c) Draw a line of best fit [1]

(d) Estimate the cost of a taxi journey of 16 km.

……

…… [1]

(e) I was charged £6.20 for a taxi journey.
Estimate the length of the journey.

……

…… [1]

22. Paul and Kay take part in a quiz.
The rules are:

For each correct answer	+5 points
For each wrong answer	-2 points

(a) In the first round, Paul gets three questions correct and one question wrong.
What is his total number of points?

……

……

…… [1]

(b) Kay has +6 points after her first four questions.
Write down **one** way she may have done this.

……

……

…… [1]

23. Solve the equation

$$3(4x - 1) = 27$$

……

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…… [3]

24. Solve the simultaneous equations

$$6x + 3y = 12$$
$$2x - y = -2$$

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…… [4]

25. Solve the equations:

(a) $3x + 9 = 30$

……

……

…… [2]

(b) $5x - 2 = 2x + 7$

……

……

……

…… [2]

26. Max shares £420 with a friend in the ratio 5:3

How much does each receive?

……

……

……

…… [2]

27. Look at the following sequence:

-4, -1, 4, 11, 20

(a) Write down the next two terms in the sequence

……

…… [1]

(b) Explain how you got your answer to part (a)

……

……

……

[1]

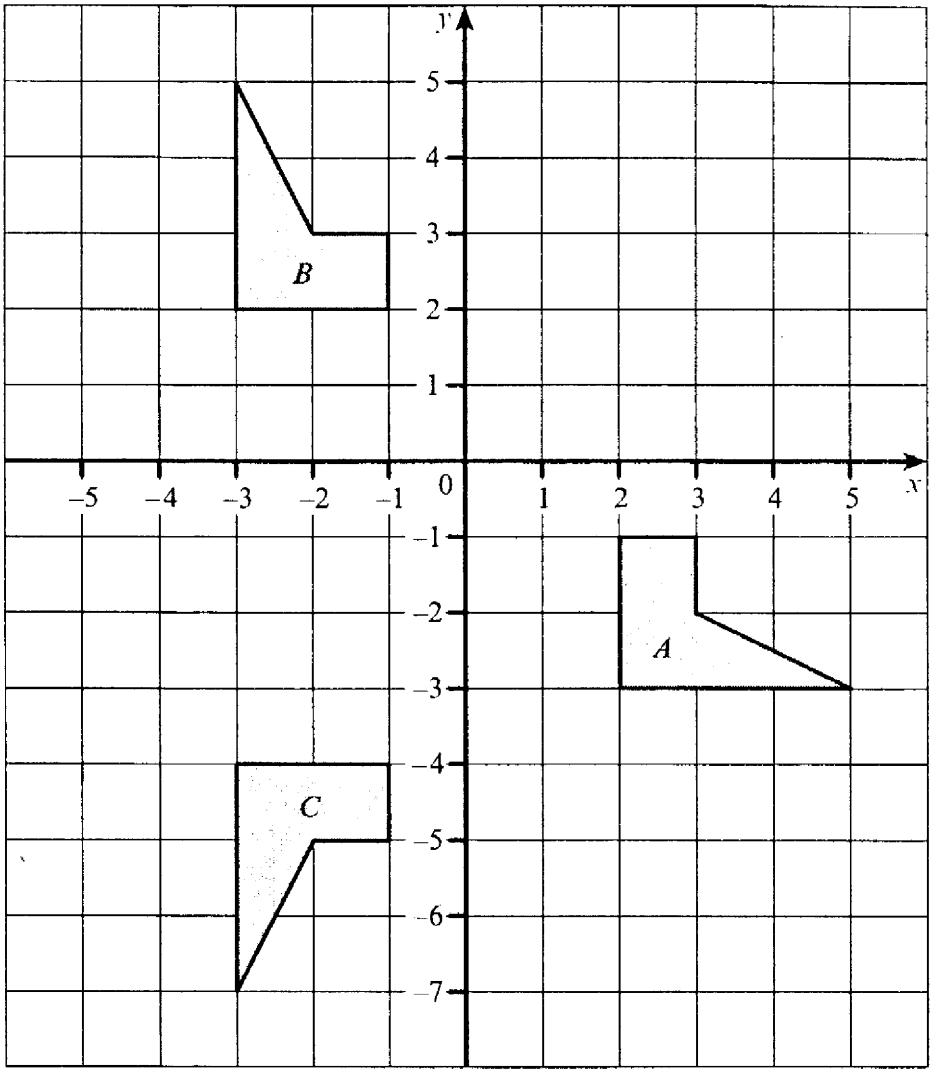
(c) Write down the nth term in the sequence

……

……

…… [2]

28.



(a) Describe the single transformation that will transform shape C to shape B

……

……

…… [2]

(b) Describe the single transformation that will transform shape A to shape C.

……

……

……

……

…… [3]

29. A carton is 50cm long, a40 cm wide and 30 com high. How many boxes measuring 10 cm x 8 cm x 3cm would fit into one of these cartons?

……

……

……

……

…… [2]

30. Given that $y = x^2 + x$

(a) Complete the table below,

x	0	1	2	3	4	5	6
y				12			42

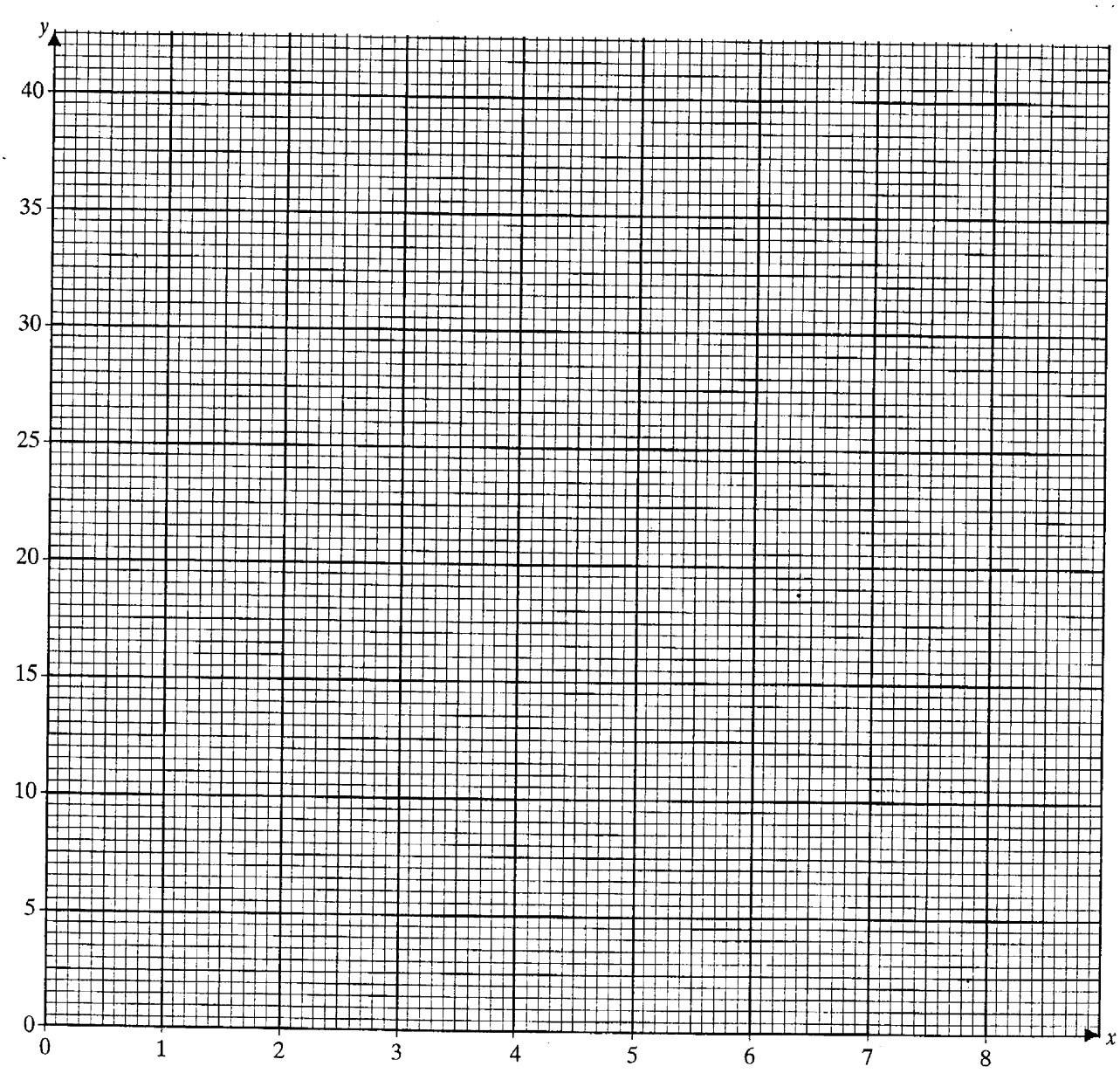
[2]

(b) Plot these points on the grid below and hence draw the graph of $y = x^2 + x$

[2]

(c) Use your graph to find the value of x when y = 25

…… [1]



31. The heights of a small group of boys were measured. The results were:

151 cm, 148 cm, 147 cm, 152cm, 154cm, 160 cm, 148 cm, 149 cm

(a) What was their median height?

……

……

…… [1]

(b) What was their modal height?

……

…… [1]

(c) What was the range of their heights?

……

…… [1]

END OF EXAM

ANSWERS FOR PAST PAPER 1

Answers to questions involving diagrams or graphs may vary slightly.

1.(a) 252 cm^2 , (b) Area of circle 154cm^2 , shaded area 98cm^2	15. (a) 251cm^2 , (b) 7
2.(a) 16 lines in total, 7 in a direction parallel to the line shown. 8 in a direction parallel to the line joining 9am in Montreal with 1pm on Toronto joining 9am and 1pm (b)(i) 3.30pm or 115 miles from Toronto (ii) 7.	16.(a) 36,45, (b) 1,2,25,36, (c) 5,23,41,43
	17. (a) 0.08, (b) 0.32, (c) 0.48, (d) 0.44
	18. 20^0
3. 166^0	19. 5x (x-2)
4. 2840	20. -2,-1,0,1,2
5. (a) 74^0, (b) 39^0 , (c)No, the triangle isn't isosceles as y ≠38^0	21. (b) The longer the journey, the higher the higher the cost. Good positive correlation. (d) £9.50, (e) 9.5 to 10km
6. 9.2 mins	
7.(a) 2, (b) y=2x+3	22. (a) 13, (b) 5+5-2-2
8. $9^2 + 40^2 = 41^2$ (Pythagoras)	23. x=2.5
9.(a) 3.84 x 10^5, (b) 5.55 x 10^{-5}, 7.22 x 10^{-5}, 2.88x10^2, 8.17 x 10^3, 5.27 x 10^5	24. $x = \frac{1}{2}$, y = 3
10. x = 3.3	25. (a) x=7, (b) x=3
11. exterior angle – 18^0, 20 sides	26. Max £262.50, friend £157.50
12. (a) 6.5, (b) $a = \frac{v - u}{t}$, (c)1.4	27. (a) 31, 44 (b) The difference between the Terms increases by 2 each time, (c) n^2 -5
13. (a) 44.4^0, (b) 19.6cm, 632cm^2	28. (a) Reflection in the line y = -1, (b) Rotation through an angle of 180^0 in an anticlockwise direction. Centre of rotation (0.5, -3.5)
14(a) Any number between 0.1666 and 0.2 (b) $\frac{3}{5}$	
29. 250	31. (a) 150cm, (b)148cm, (c) 13cm
30. (a) 0,2,6,20,30, (c) 4.6	

PAST PAPER 2

Edge Hill University

Test Paper 3
2001

Two and a half hours

Name……

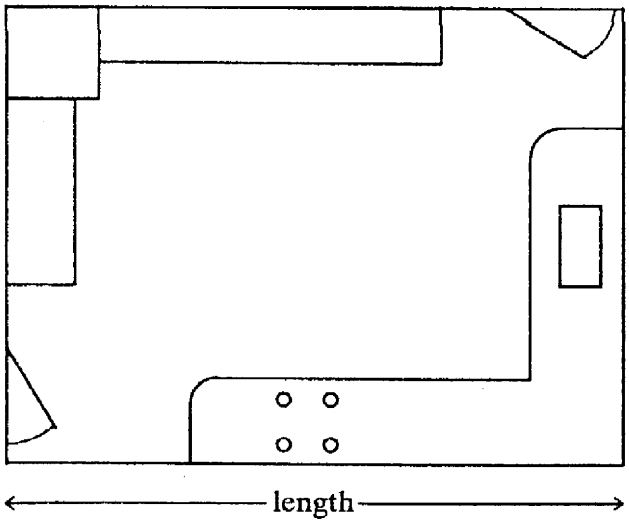
ATTEMPT ALL QUESTIONS

- Show all your working in the space provided and make sure your answer is clear.
- It is assumed that you have a scientific calculator, ruler and protractor.
- If your calculator does not have a π button, take the value of π to be 3.142
- Diagrams are not necessarily drawn to scale.
- The marks for each question are given in brackets by the side of the question.
- Marks may be given for method even if your answer is wrong.
- The total marks available are 120.

Calculator Questions

1. This is an architect's plan for a new church kitchen.

Scale 1:50



(a) What is the actual length of the kitchen? Give your answer in metres.

……

……

…… [2]

(b) The doorways are 90cm wide. To improve disabled access, it has been decided that the doorways should be increased by 30%. How wide will they be after the work has been completed?

……

……

…… [2]

2. Solve the equation

$3x - 9 = 5x - 5$

……

……

…… [2]

3. A kilometre is approximately $\frac{5}{8}$ of a mile. Jean is travelling at an average speed of 36 miles per hour as she drives through a French village with a speed limit of 50 Kilometres per hour. Is she exceeding the speed limit? Show your working clearly.

……

……

…… [2]

4. Snooker is played with 15 red balls, 6 other coloured balls and one white ball. All 22 balls are kept in a box.

(a) A ball is taken out of the box at random.
What is the probability that it is a red ball?

……

…… [1]

(b) The ball is put back in the box and another ball is taken out at random.
Calculate the probability that both balls taken out are red.

……

……

…… [2]

5. The mass of one atom of oxygen is given as 2.66×10^{-23} grams.
The mass of one atom of hydrogen is given as 1.67×10^{-24} grams.

A molecule of water contains two atoms of hydrogen and one atom of oxygen.

(a) Calculate the mass of the two atoms of hydrogen in a molecule of water.

……

……

…… [2]

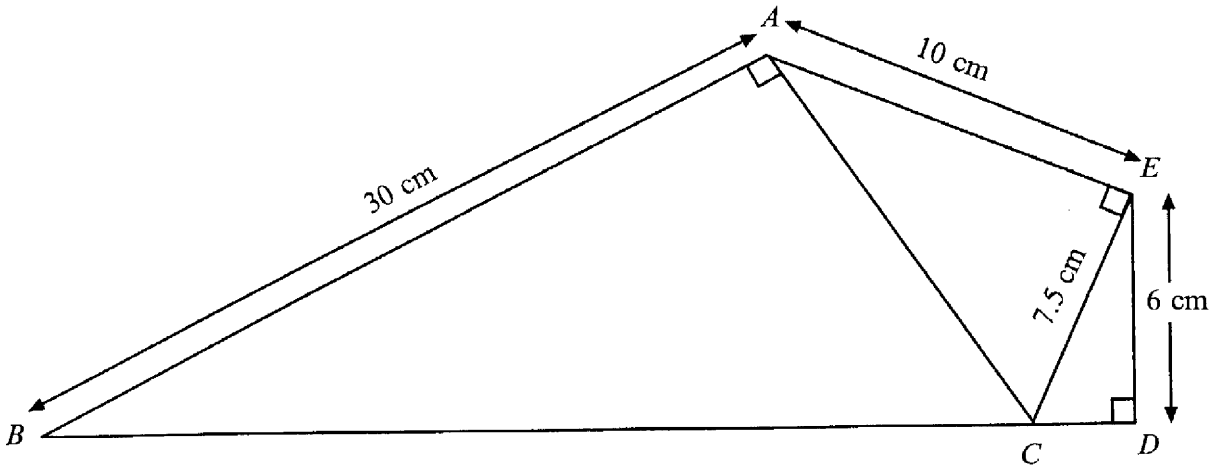
(b) Calculate the mass of the molecule of water.

……

……

…… [2]

6.



The diagram is not drawn to scale.

Use Pythagoras' Theorem to calculate

(a) The length of CD

.....

.....

.....

.....

..... [2]

(b) The length of CB

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..... [3]

7. Find the value of $ab^2 + \frac{b}{a}$ when a = 5 and b = - 3

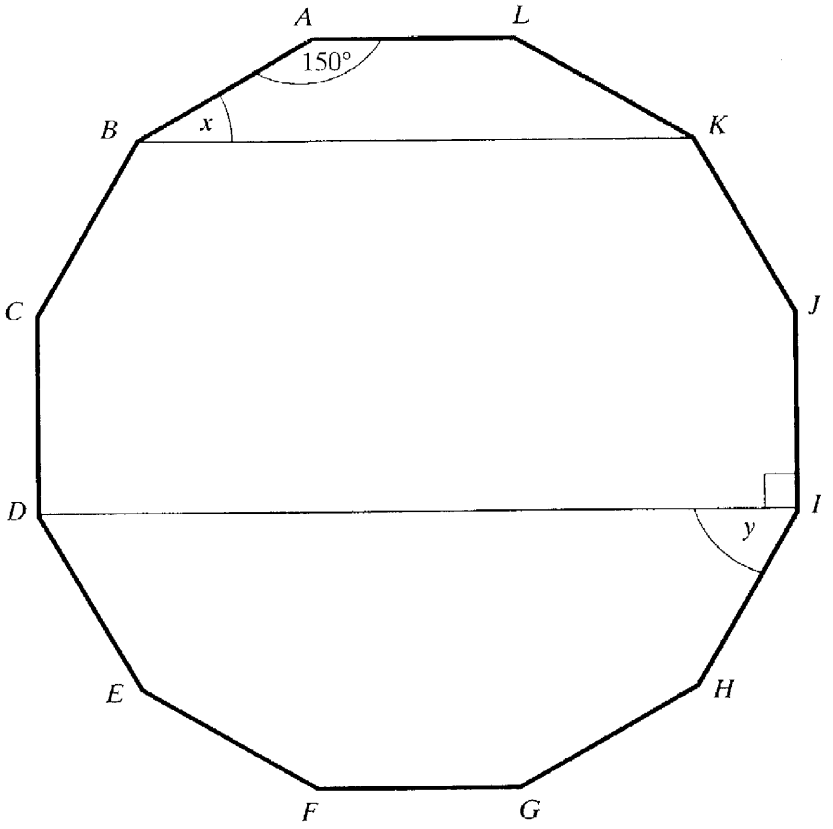
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…… [2]

8. The diagram shows a regular 12 sided polygon (called a dodecagon).
Each interior angle is 150°.

The lines BK and DI have been drawn.



(a)

What is the special name for the polygon ALKB?

……

…… [1]

PTO

(b) Calculate the size of the angle marked x.

……

……

…… [2]

(c) Calculate the size of the angle marked y.

……

……

…… [2]

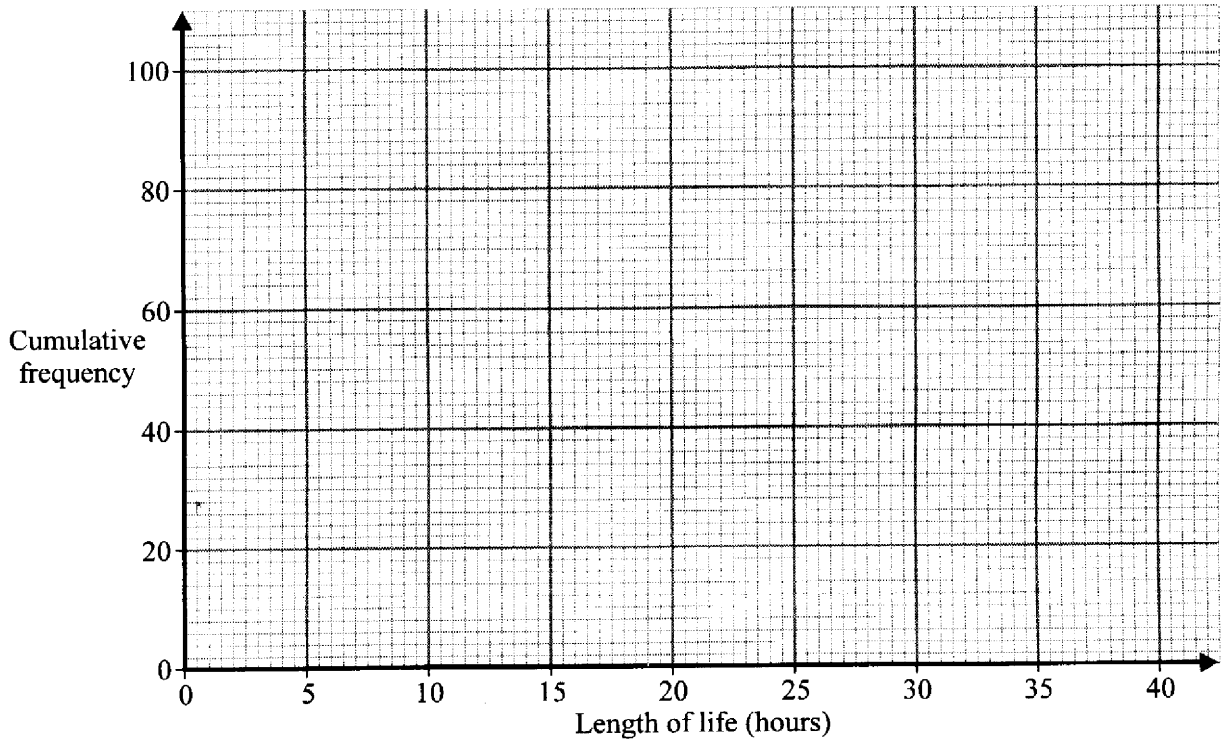
9. The distance from the planet Earth to Kronos is 35 000 000 000 000 000 miles.
Write this number in standard form.

……

…… [2]

10. The length of life of 100 batteries of a certain make was recorded.
The table shows the results.

Length of life (hours)	<10	<15	<20	<25	<30	<35	<40
Cumulative frequency	0	2	9	50	86	96	100



(a) Draw a cumulative frequency graph to illustrate this data. [2]

(b) How many batteries had a life of more than 32 hours?

……

…… [1]

(c) Use your graph to estimate the median.

……

…… [2]

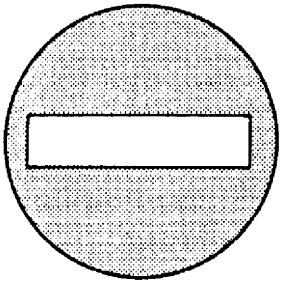
(d) Use your graph to estimate the interquartile range.

……

……

…… [3]

11. A 'No Entry' sign consists of a white rectangle on a red circle as shown:



The sign has a radius of 35cm and the white rectangle is 60cm long and 10cm wide.

(a) What is the perimeter of the white rectangle?

……

……

[1]

(b) Find the area that is painted red.

……

……

……

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……

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[4]

12. A 'Travel Saver Card' entitles the holder to 40% off the normal price of a journey.

(a) A particular journey normally costs £28.50.
How much would it cost with a Travel Saver Card?

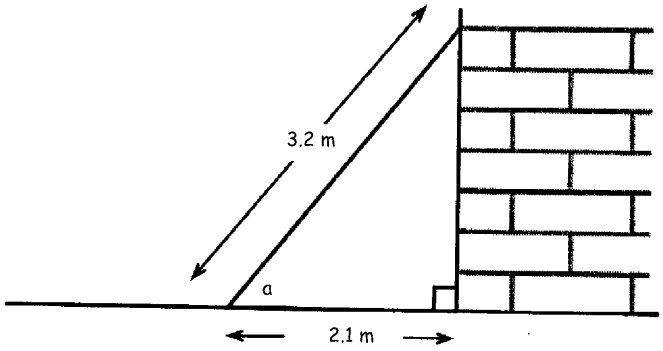
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…… [2]

13. The diagram shows a ladder leaning against a wall.



(a) Calculate the size of angle a.

……

……

……

…… [3]

14. Solve the inequality

(a) $3x - 7 < x - 3$

……

……

……

……

[2]

(b) Solve the inequality

$x^2 < 9$

……

……

……

…… [2]

(c) List the values of x which satisfy your answer to part (b)

……

……

……

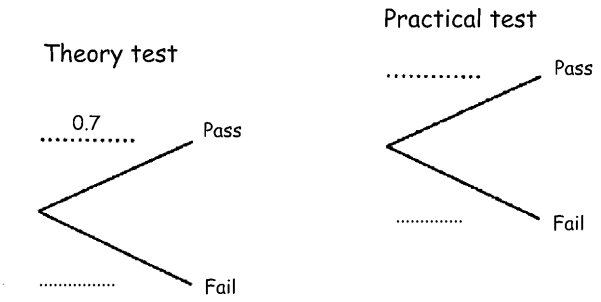
[2]

15. There are two parts to a driving test, a theory test and a practical test. You **must** pass the theory test before you are allowed to take the practical test.

Rob is taking his driving test.

The probability that he passes the theory test is 0.7
The probability that he passes the practical test is 0.9

(a) The tree diagram shows the possible outcomes. Fill in the missing probabilities.



(b) Calculate the probability that Rob passes both parts of his driving test.

……

……

……

[2]

(c) Calculate the probability that he passes the theory test but fails the practical test.

……

……

……

……. [2]

(d) Calculate the probability that he fails the driving test.

……

……

……. [2]

16. In computing terms, a kilobyte is 2^{10} bytes but the prefix kilo usually refers to a thousand. How many more than 1000 is 2^{10}?

……

……

……. [2]

17. (a) List the prime numbers that lie between 20 and 30.

……

…… [2]

(b) List the square numbers that lie between 20 and 50.

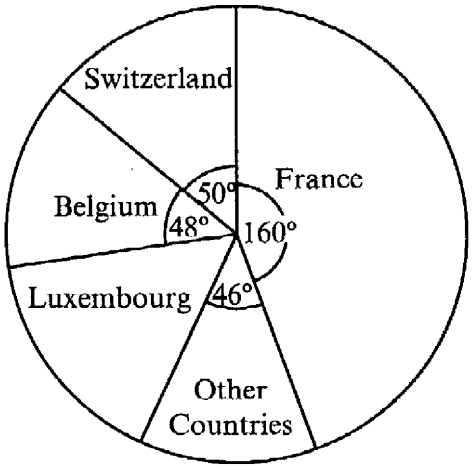
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…… [2]

18. 2700 people work in one department of the European Parliament.

The pie chart shows where the people come from.



(a) Calculate the size of the angle for Luxembourg.

……

…… [1]

(b) From the information given, calculate how many of the 2700 people came from France.

……

……

……

…… [2]

19.(a) Write down the next two terms in the sequence

-1, 2, 7, 14, 23, ..., ..., [2]

(b) Explain how you got your answer.

……

……

…… [1]

(c) What would be the nth term for the sequence?

……

…… [2]

20. (a) Complete the following number pattern.

1^3 = 1 x 1 x 1 = 1

2^3 = 2 x 2 x 2 = 8

3^3 = ……. = 27

4^3 = ……. = …….. [1]

(b) Use your answers to part (a) to complete this number pattern.

1^3 = 1 = 1^2

$1^3 + 2^3$ = 9 = 3^2

$1^3 + 2^3 + 3^3$ = 36 = 6^2

$1^3 + 2^3 + 3^3 + 4^3$ = …… = …… [2]

(c) A line of pattern (b) is shown below.

Fill in the missing parts of this line.

…… = 441 = …… [2]

21. Solve the simultaneous equations

$3a + 2b = 29$

$2a - 3b = 2$

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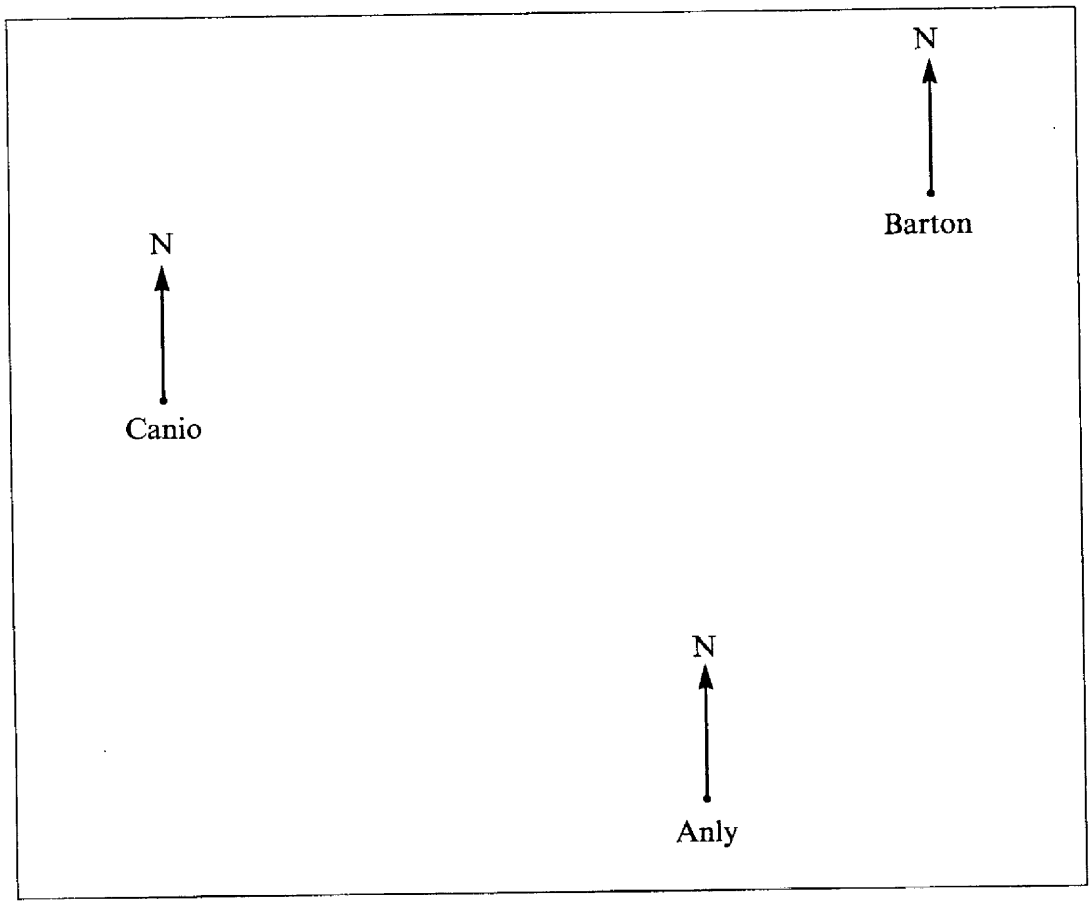
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..... [4]

22. The map shows the position of three towns.



PTO for questions

(a) What is the bearing of Barton from Anly?

……

……

…… [2]

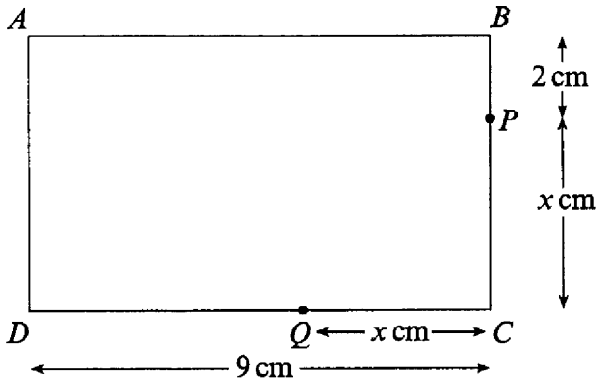
(b) What is the bearing of Canio from Barton?

……

……

…… [2]

23. ABCD is a rectangle



(a) Write down the expression, in terms of x, for

(i) The length of BC,

……

…… [1]

(ii) The length of DQ

……

…… [1]

(b) (i) Given that BC =DQ, use your answers to (a) to write down an equation in terms of x.

……

…… [1]

PTO for part (ii)

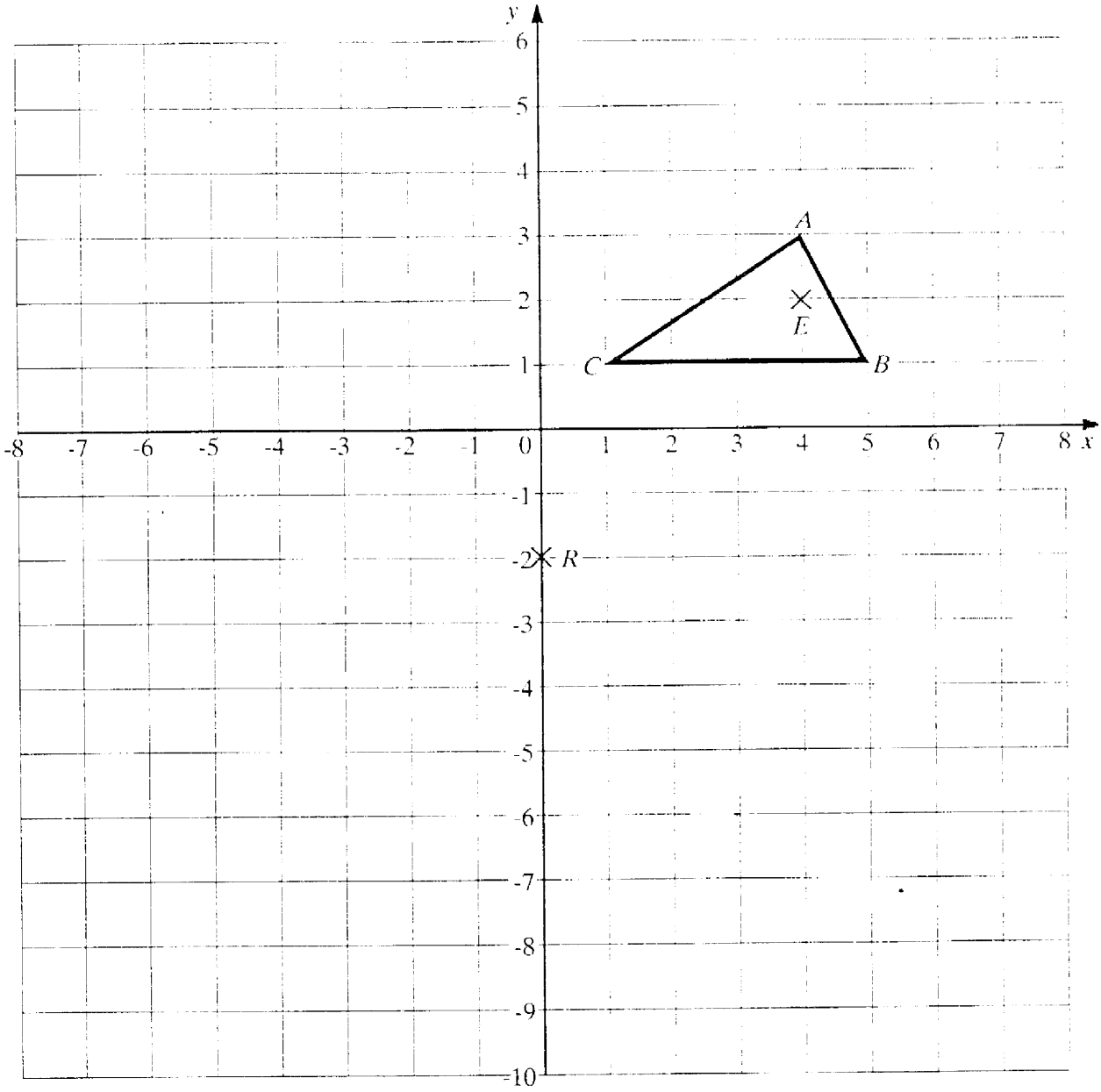
(ii) Solve your equation to find the value of x

……

……

…… [2]

24. A triangle ABC has vertices A(4,3), B(5,1), C(1,1).



(a) Draw an enlargement of triangle ABC by scale factor of 3 from the centre of enlargement E(4,1). Label the enlarged triangle A'B'C'. [2]

(b) Draw the image of the triangle A'B'C' after it has been rotated through 180° about the point R(0,-2). Label the new triangle A''B''C''. [2]

25. Given that $y = x^2 - x$

(a) Complete the table below,

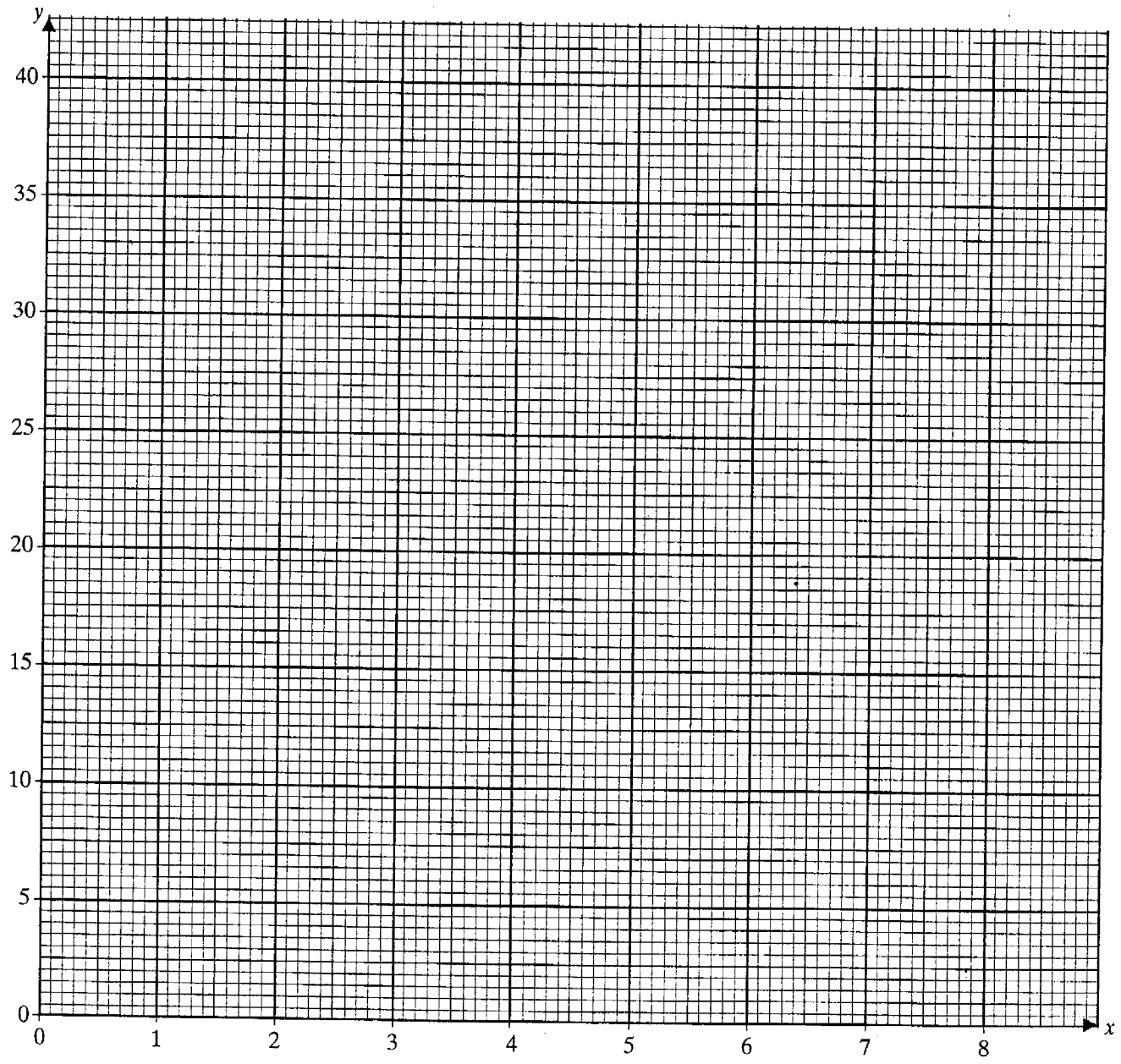
x	1	2	3	4	5	6	7
y			6			30	

[2]

(b) Plot these points on the grid below and hence draw the graph of $y = x^2 - x$

[2]

(c) Use your graph to find the value of x when y = 35



..... [1]

26.(a) A delivery van driver left Liverpool at 9.30 am, stopped at the motorway services for $\frac{1}{2}$ hour at 11.30 am and finally arrived at her destination in London, 210 miles from home at 1pm. What was her average speed for the whole journey?

……

……

……

…… [2]

(b) After a break of $\frac{3}{4}$ hour, she returned to Liverpool without stopping. Her average speed for this part of the journey was 55 mph. Complete the distance time graph to show this information.

[3]

27. A magic square is shown below.
Every row, column and diagonal adds up to the same total of 15.

8	**3**	**4**
1	**5**	**9**
6	**7**	**2**

(a) For the magic square below, every row, column and diagonal should add up to 3. Fill in the missing numbers.

2	**-3**	**4**
3	**1**	
-2		**0**

[2]

28. Expand and simplify
$(2x - 3)^2$

……

……

……

…… [2]

29. The table shows the largest quantity of salt, w grams which can be dissolved in a beaker of water at temperature t°

t° C	10	20	25	30	40	50	60
w grams	54	58	60	62	66	70	74

(a) On the grid below, plot the points and draw a graph to illustrate this information.
[3]

(b) Use your graph to find the lowest temperature that which 63g of salt will dissolve in water.

……

…… [1]

(c) Use your graph to find the largest amount of salt that will dissolve in the water at 44° C.

……

…… [1]

(d) The equation of the graph is of the form

$$w = at + b$$

Use your graph to estimate the values of the constants a and b.

……

……

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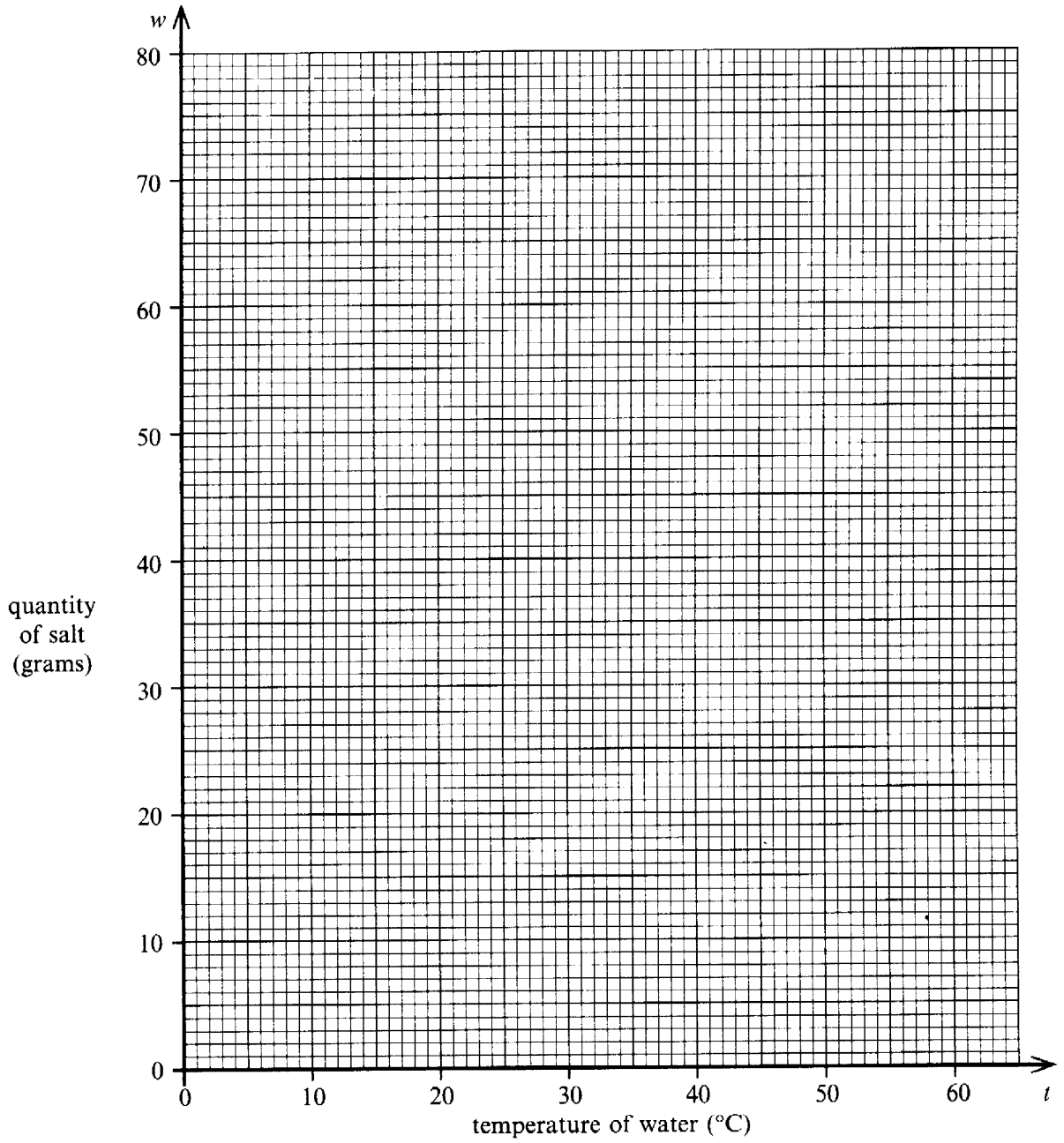
…… [3]

(e) Use the equation to calculate the largest amount of salt which will dissolve in the water at 95° C.

……

……

…… [2]


w
80
70
60
50
40
30
20
10
0
quantity of salt (grams)
0
10
20
30
40
50
60
t
temperature of water (°C)

END OF EXAM

ANSWERS FOR PAST PAPER 2

1. (a) 4m, (b) 117cm	17. (a) 23, 29 (b) 25, 36, 49
2. x= -2	18. (a) 56^o, (b) 1200 people
3. Yes she is exceeding the limit. She is travelling at approximately 57.6 km per hour.	19. (a) 34, 47 (b) The difference between terms increases by two each time. (c) n^2-2
4. (a) $\frac{15}{22}$, (b) $\frac{225}{484}$	20. (a) 3 x 3 x 3, 4 x 4 x 4 = 64 (b) 100 = 10^2, (c) $1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 = 441 = 21^2$
5. (a) 3.34 x 10^{-24}, (b) 3.606 x 10^{-24}	21. a = 7, b = 4
6. (a) 4.5cm, (b) 32.5cm	22. (a) 020^o, (b) 255^o
7. 44.4	23. (a) (i) 2 + x, (ii) 9 – x (b) (i) 2 + x = - x, (ii) 3.5
8. (a) Trapezium, (b) 30^o, (c) 60^o	24. (a) A' (4,5), B'(7,1), C'(-5,-1) (b) A''(-4,-9), B''(-7,-3), C''(5,-3)
9. 3.5 x 10^{16}	25. (a) 0, 2, 12, 20, 42 (c) 6.4
10. (b) 92, (c) 25, (d) 5	26. (a) 60mph (b) through (1.45,210) and then (3.45,100)
11. (a) 140cm, (b) Area of circle = 3848.45cm^2 Area of rectangle = 600cm^2 Red area = 3248.45cm^2	27. (a) -1, 5
12. £17.10	28. $4x^2$ - 12x + 9
13. (a) 49^o	29. (a) on graph (b) 32^oc, (c) 68g, (d)a = 0.4, b = 50 (e) 0.37
14. (a) x<2, (b) x<3 or x>-3 i.e -3<x<3 (c) -2, -1, 0, 1, 2	
15. (a) 0.3, 0.9, 0.1 (b) 0.63, (c) 0.07 (d) 0.37	
16. 2^{10} = 1024, 1024 – 1000=24	

PAST PAPER 3

Edge Hill University

Test Paper 1
2003

Two and a half hours

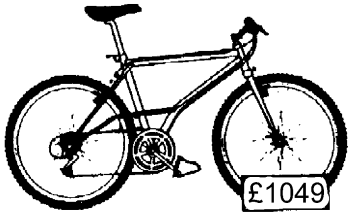
Name .....

ATTEMPT ALL QUESTIONS

- Show all your working in the space provided and make sure your answer is clear.
- It is assumed that you have a scientific calculator, ruler and protractor.
- If your calculator does not have a π button, take the value of π to be 3.142
- Diagrams are not necessarily drawn to scale.
- The marks for each question are given in brackets by the side of the question.
- Marks may be given for method even if your answer is wrong.
- The total marks available are 120.

Calculator Questions

1. The cash price of a mountain bike is £1049



Fred buys the bike by paying a £200 deposit and 12 monthly instalments of £75.
How much more than the cash price does Fred pay?

……

……

……

…… [2]

2. Solve the equation

$3x + 8 = 23 - 3x$

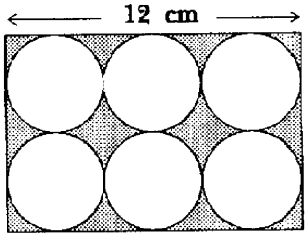
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……

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…… [2]

3. Circular tops are stamped out of a sheet of metal like the one shown in the diagram below.



How much of the material is waste?

……

……

……

……

……

…… [5]

4. The table shows the average speed of planets that orbit the sun.

Planet	Average speed of orbit (Km/h)
Jupiter	4.7×10^4
Mercury	1.7×10^5
Neptune	1.2×10^4
Pluto	1.7×10^4
Saturn	3.5×10^4
Uranus	2.5×10^5

(a) Which planet is travelling the slowest?

……

…… [1]

(b) How far will Uranus travel in 24 hours? Give your answer in standard form.

……

……

……

…… [2]

(c) What is the difference between the average speeds of Neptune and Pluto? Give your answer in standard form.

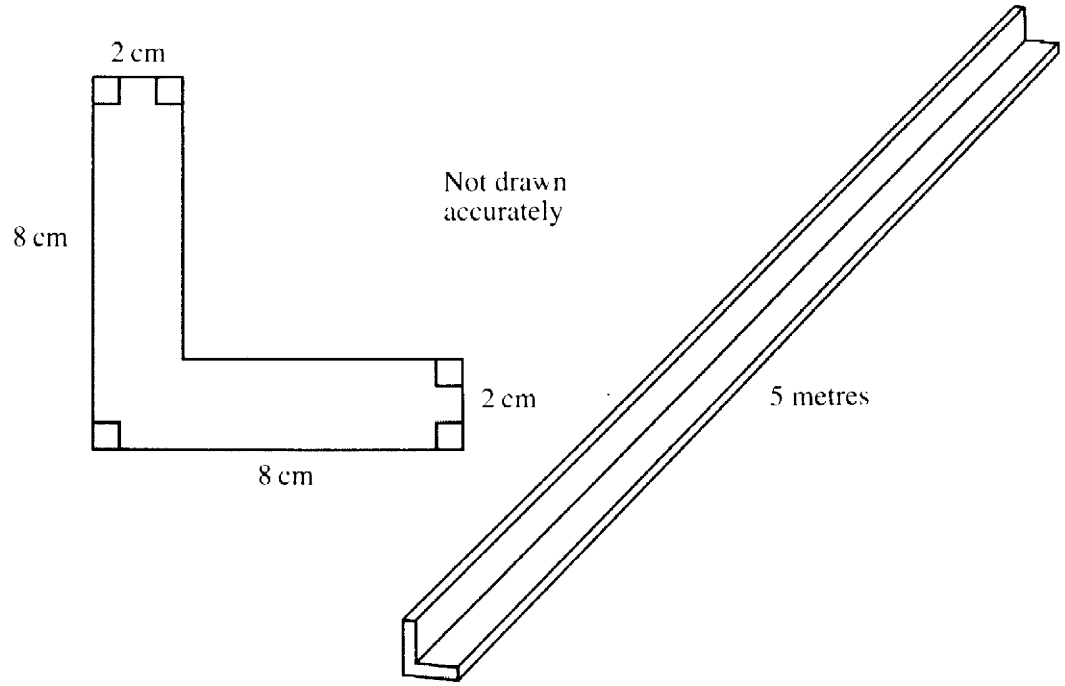
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…… [2]

5. A girder is 5m long. Its cross section is L shaped as shown below.



Find the volume of the girder. Remember to state the units in your answer.

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.....

.....

.....

..... [5]

6. The distance between Heysham and the Isle of Man is 80m.

A hovercraft travels at 50km per hour.

How long does the journey take? Give your answer in hours and minutes

.....

.....

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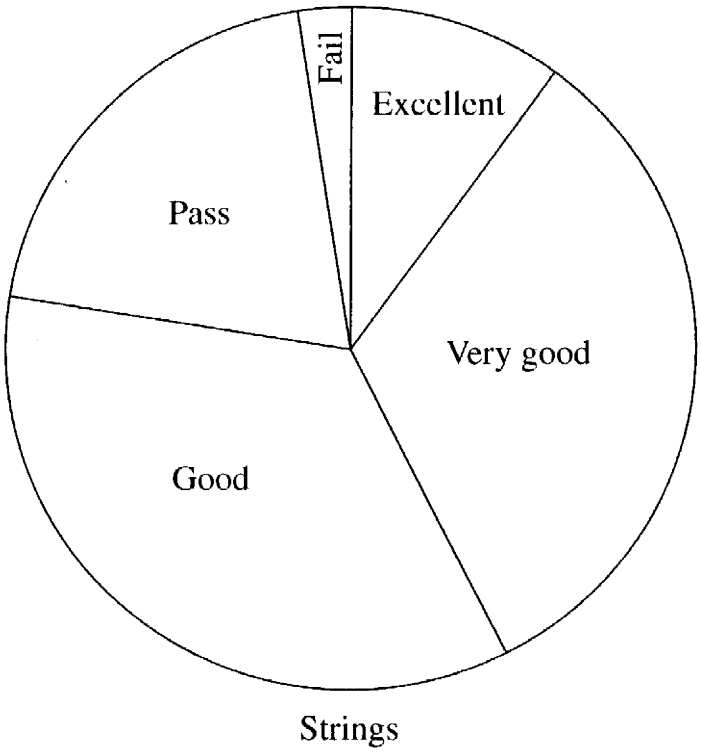
..... [3]

7. The table below shows the number of candidates at each grade for two music examinations, Strings and Brass

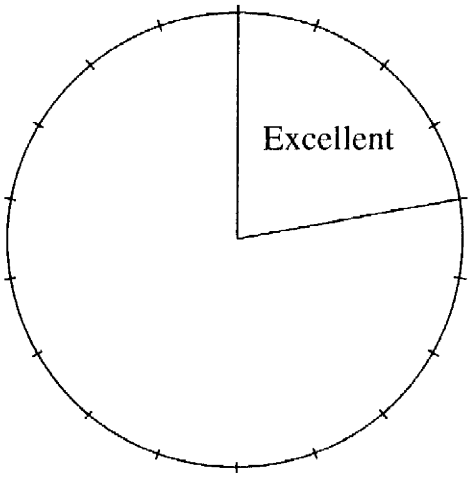
	Grades					
	Excellent	Very good	Good	Pass	Fail	Total number of candidates
Strings	200	650	700	400	50	2000
Brass	200	300	250	100	50	900

The pie chart for Strings has been drawn for you.
Complete the pie chart for brass.

[3]



Strings



Brass

8. Use your calculator to evaluate the following questions. Give your answers to two places of decimals.

(a) $\dfrac{5.14 + 2.86}{1.38 + 3.57}$

……

……

…… [1]

(b) $\dfrac{5.14 + 2.86}{1.38} + 3.57$

……

……

…… [1]

(c) $5.14 + \dfrac{2.86}{1.38 + 3.57}$

……

……

…… [1]

9(a) Four of the angles of an octagon are each 125°. The other angles are all equal. Find the size of one of the other angles.

……

……

……

…… [3]

(b)(i)One of the interior angles of a regular polygon is 156°.Find the size of an exterior angle of this polygon.

……

…… [1]

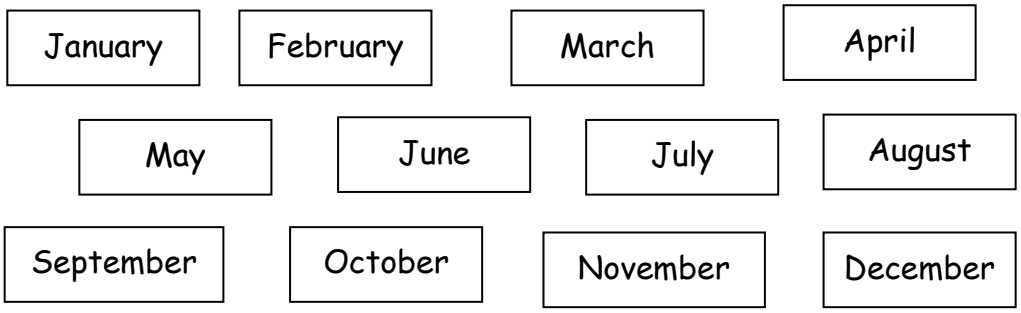
(ii) How many sides has this polygon got?

…… [1]

10.

Thirty days hath September, April, June and November
All the rest have thirty one
Excepting February alone
Which has but twenty eight days clear
And twenty nine in a leap year

Twelve cards are labeled with the months of the year and put in a box.



Freda takes a card out of the box without looking at it.

(a) What is the probability that the month drawn has 31 days?

……

…… [1]

(b) What is the probability that the month drawn has more than 27 days?

……

…… [1]

(c) A card is then drawn out and not replaced. A second card is then drawn. The number of days in the two months drawn are added together. What is the probability that the total number of days in the two months is 61?

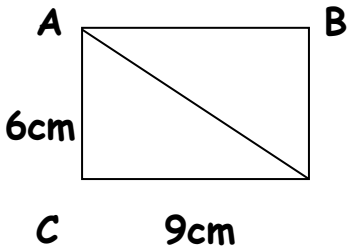
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…… [3]

11. A rectangle ABCD measures 6cm by 9cm.



Not drawn to scale

(a) Find the area of the rectangle.

……

…… [1]

(b) Calculate the perimeter of the rectangle

……

…… [1]

(c) Calculate the length of the diagonal AD. Show all your working. Give your answer correct to two places of decimals.

……

……

……

…… [2]

(d) Nelma calculates the angle ADC to be 56.31°. Is she correct? Show all your working.

……

……

……

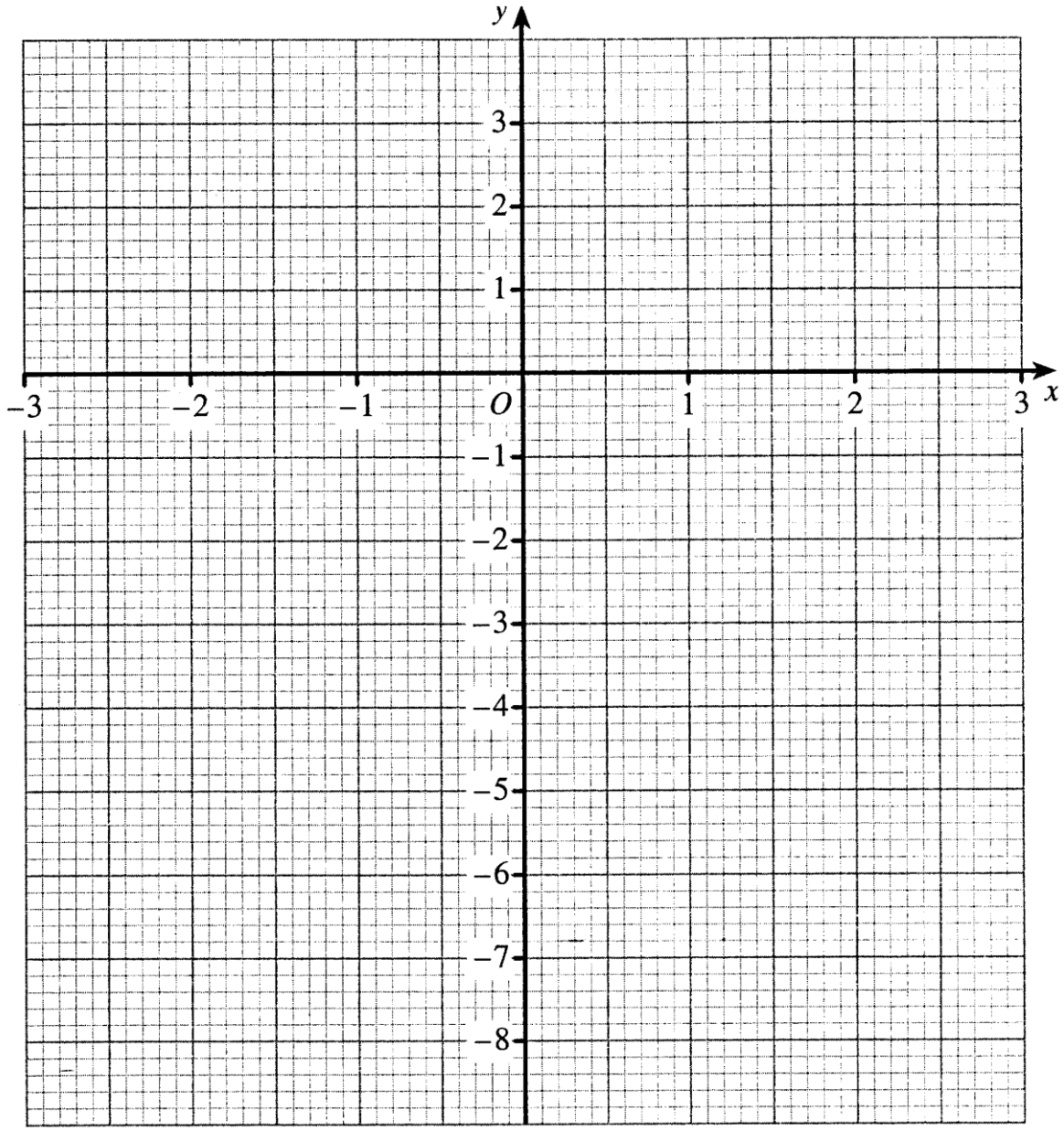
…… [3]

12(a). Complete the table for the graph of $y = x^2 + 2x - 6$

x	-3	-2	-1	0	1	2
y	-3	-6				

[2]

(b) Draw the graph on the grid.



[3]

(c) **Use your graph** to solve the equation $x^2 + 2x - 6 = -4$

……

…… [2]

13(a) Draw the lines of symmetry on this rectangle.

[1]



(b) What is the order of rotational symmetry of this rectangle?

……

…… [1]

14. The pupils in a class are asked how many goals they each scored in a netball lesson. The results are shown in the table.

Number of goals	Number of pupils
0	1
1	8
2	11
3	5
4	4
5	1

Calculate the mean number of goals per pupil.

……

……

……

……

……

……

…… [3]

15(a) Here are the first three lines of a number pattern.

Line 1 $\mathbf{1^2 + 2 = 3^2 - 6}$

Line 2 $\mathbf{2^2 + 4 = 4^2 - 8}$

Line 3 $\mathbf{3^2 + 6 = 5^2 - 10}$

Write down the fourth line of this pattern

……

…… [2]

(b) Here is another pattern

Line 1 $\mathbf{1^2 + 2 = 1 \times 3}$

Line 2 $\mathbf{2^2 + 4 = 2 \times 4}$

Line 3 $\mathbf{3^2 + 6 = 3 \times 5}$

(i) Write down the fourth line of this pattern

……

…… [1]

(ii) Write down the *n*th line of this pattern.

……

…… [2]

(c) Expand and simplify

$(n + 2)^2 - 2(n + 2)$

……

……

……

……

…… [4]

16. A quadrilateral with 4 equal sides and 4 right angles is called a square.
What mathematical name is given to :

(a) A quadrilateral with 4 equal sides but no right angles?

……

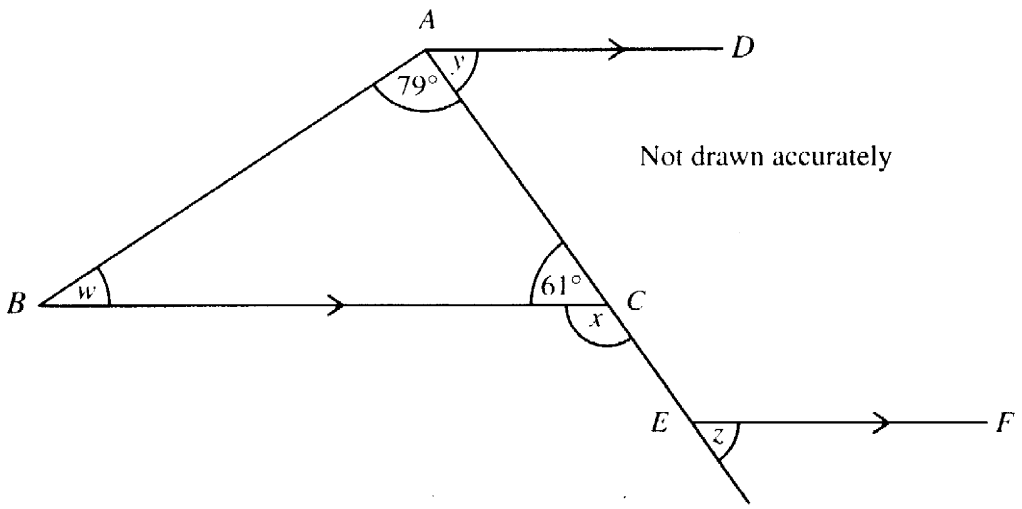
…… [1]

(b) A quadrilateral with 2 pairs of opposite sides equal but diagonals of different lengths?

……

…… [2]

17. AD, BC and EF are parallel. Angle BAC = 79°. Angle ACB = 61°



Work out the size of the angles marked *w*, *x*, *y* and *z*

Angle *w*

……

…… [1]

Angle *x*

……

…… [1]

Angle *y*

……

…… [1]

Angle z

……

…… [1]

18. Amy is x years old

(a) Her brother Brian is 4 years older than Amy.

Write down an expression, in terms of x, for Brian's age.

……

…… [1]

(b) Their mother is three times as old as Amy.

Write down an expression in terms of x, for their mother's age.

……

…… [1]

(c) The total of their three ages is 64 years.

Write down an equation in x

……

……

…… [2]

(d) Solve your equation for x and find Brian's age

……

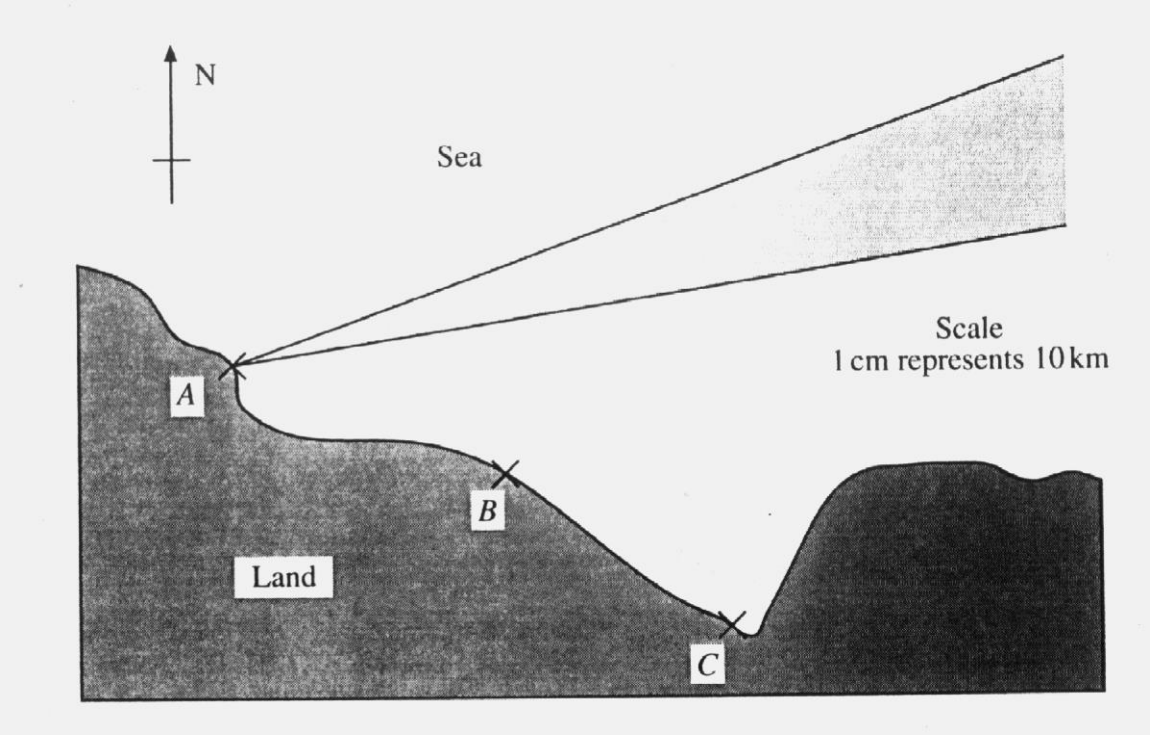
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……

…… [3]

19. Three radio stations at A, B and C receive a distress call from a boat



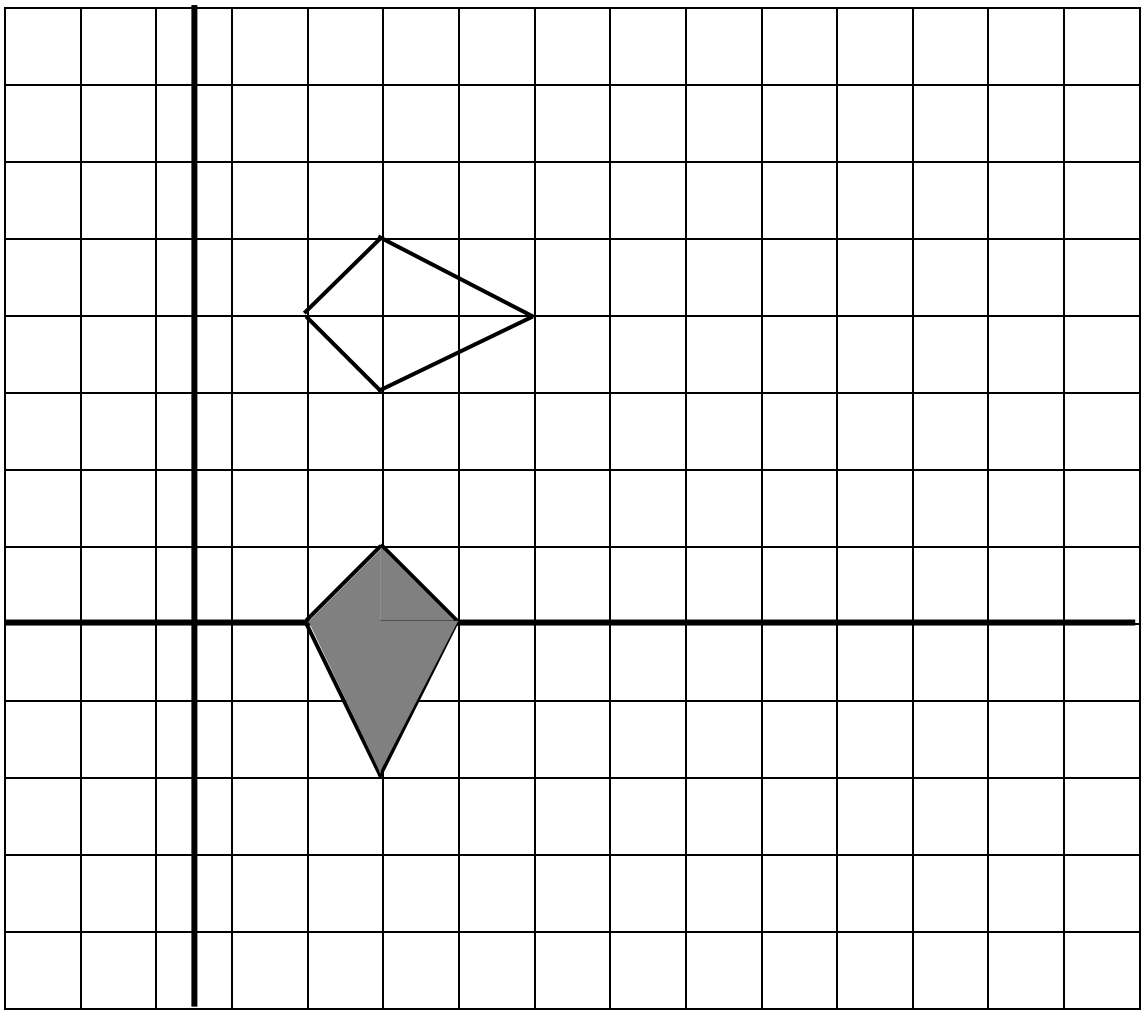
Station A can tell that the boat is on a bearing of between 070° and 080° from A. (This area is shown on the diagram)

Station B can tell that the boat is between 30 km and 40 km from B.

Station C can tell that the boat is between a bearing of 340° and 355° from C.

Show clearly on the diagram where the boat could be. [4]

20.



(a) Describe the transformation that maps the shaded shape ABCD onto A'B'C'D'.

……

……

…… [2]

(b) Using (-2,-2) as the centre of enlargement, enlarge ABCD by a scale factor of 2.

[2]

21. Solve the simultaneous equations

$3c + 5d = 23$
$4c - 3d = -37$

……

……

……

……

……

……

……

……

……

…… [4]

22. A box contains counters which are numbered 1, 2, 3, 4 or 5.
A counter is taken from the box at random.

(a) Complete the table to show the probability of each number being chosen.

Number on counter	Probability
1	0.20
2	0.30
3	0.15
4	
5	0.10

[1]

(b) Is the number on the counter chosen more likely to be odd or even? You must show your working

……

……

……

…… [2]

23. The straight line $y = mx + c$ is parallel to the straight line $y = 2x - 5$ and passes through the point $(-1,1)$

(a) Find m

……

……

…… [1]

(b) Find c

……

……

…… [2]

24(a) Expand the brackets

(4x – 3)(3x + 4)

……

……

…… [2]

(b) Factorise the expression

12y – 18z

……

…… [1]

(c)(i) Factorise the expression

x^2 – 3x – 10

……

……

…… [2]

(ii) Using your answer from part (i), solve the equation

x^2 – 3x – 10 = 0

……

……

…… [2]

25. The table shows the mathematics test results for 90 students.
The test was marked out of 60.

Mark (x)	Frequency	Cumulative Frequency
$0 \leq x \leq 10$	10	10
$10 < x \leq 20$	17	
$20 < x \leq 30$	27	
$30 < x \leq 40$	18	
$40 < x \leq 50$	10	
$50 < x \leq 60$	8	

(a) Complete the cumulative frequency column

[1]

(e) Draw a cumulative frequency diagram on the grid opposite

[3]

(f) Use your diagram to estimate

(i) the median

……

…… [2]

(ii) the interquartile range

……

……

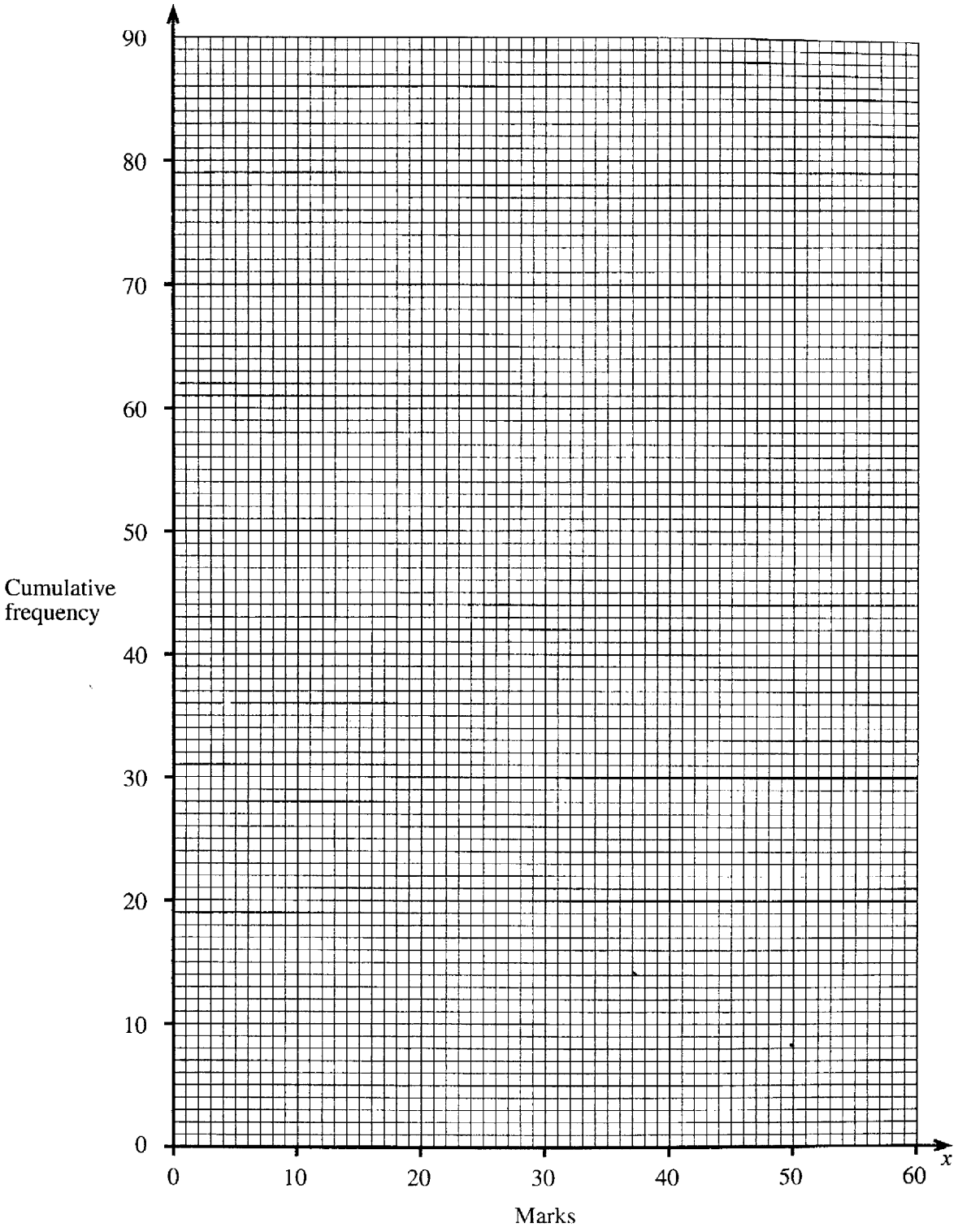
…… [1]

(g) The pass mark for the test is 25 marks.
Use your graph to estimate how many pupils pass the test.

……

……

…… [2]


90
80
70
60
50
40
30
20
10
0
Cumulative frequency
0
10
20
30
40
50
60
x
Marks

26.

3	5	7	9	11
8	10	12	14	16
13	15	17	19	21
18	20	22	24	26

(a) Which of the numbers in the table are multiples of 7

……

……

…… [2]

(b) Which numbers in the table are prime numbers?

……

……

…… [2]

(c) Which numbers in the table are square numbers?

……

……

…… [2]

END OF EXAM

ANSWERS FOR PAST PAPER 3

1. £51	16. (a) Rhombus, Parallelogram
2. 205	17. 40^o, 119^o, 61^o, 61^o
3. 20.6cm^2	18. (a) x+4, (b)3x, (c)3x+x+x+4=64, (d) x=12, Brian=16
4. (a) Neptune, (b) $6.0x10^6$, (c) $5.0x10^3$	19. Diagram
5. 1.4m^3	20. (a) rotation, anticlockwise 90^o, (4,2), (6,4), (8,2), (6,-2)
6. 1 hour 36 minutes	21. c = -4, d = 7
7. 6, 5, 2 and 1 sections respectively for VG, G, P and F	22. (a)0.5, (b) odd total 0.45, even total 0.55. Even more likely
8. (a) 1.62, (b) 9.37, (c) 5.72	23.(a) m=2, (b) c=3
9. (a) 145^o, (b)i) 24^o, ii) 15	24. (a) $12x^2 – 9x +16x -12 = 12x^2 + 7x – 12$ (b) 12y-18z = 6(2y-3z) (c)i) x^2-3x-10=0 = (x-5)(x+2)=0, ii) x=5 or x=-2
10. (a) 7/12, (b)1, (c)14/33	25. On graph.
11. (a) 54cm^2, (b) 30cm, (c)$6^2+9^2=36+81=117$ $\sqrt{117} = 10.82$ (d) tan ADC = 6/9, tan ADC = 2/3	26. (a) 7, 14, 21 (b) 3, 5, 7, 11, 13, 17, 19 (c) 9 and 16
12. (a) x -3, -3, -3, 0, 1, 2 y -3, -6, -7, -6, -3, 2 (b) graph, (c) graph	
13. (b) 2	
14. 2.2	
15. (a) $4^2+8=6-12$, (b) (i) $4^2+8=4x6$, (ii) $n^2+2n=n(n+2)$, (c)n^2+2n	

PAST PAPER 4

Edge Hill University

Paper 1
2004

Two and a half hours

Name……

ATTEMPT ALL QUESTIONS

- Show all your working in the space provided and make sure your answer is clear.
- It is assumed that you have a scientific calculator, ruler and protractor.
- If your calculator does not have a π button, take the value of π to be 3.142
- Diagrams are not necessarily drawn to scale.
- The marks for each question are given in brackets by the side of the question.
- Marks may be given for method even if your answer is wrong.
- The total marks available are 120.

Calculator Questions

1.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Bryan and Sue were playing a guessing game. Sue thought of a number between 1 and 100 which Bryan had to guess. Bryan was allowed to ask 5 questions, which are listed with Sue's responses in the table below.

Bryan's Questions	**Sue's Responses**
Is it prime?	No
Is it odd?	No
Is it less than 50?	Yes
Is it a multiple of 3?	Yes
Is it a multiple of 7?	Yes

What is the number that Sue thought of?

…… [3]

2. The population of Australia is 18 million, of which 3.5 million people live in Sydney and 1 million people live in Perth.

(a) What fraction of the population live in Perth?

……

……

…… [2]

(b) What fraction of the population live in Perth or Sydney?

……

……

…… [2]

3(a) Thelma borrowed £1000 on her credit card. At the end of the month, she paid off 5% of the money she owed. How much did she then owe?

……

…… [1]

(b) Interest was then charged on her account at a rate of 2%. How much did she then owe?

……

…… [1]

(c) If she continues in this way, paying off 5% and then being charged 2% interest, how much will her debt have been reduced by at the end of the fourth month, assuming that she doesn't spend any more money on her card?

……

……

……

……

…… [3]

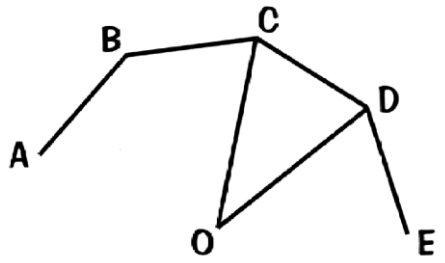
(d) How much money will she have paid the credit card company in total by the end of the fourth month?

……

……

…… [2]

4. The figure shows part of a regular 9 sided figure. Its centre is O.



(a) Calculate the size of angle COD:

……

…… [1]

(b) Calculate the size of angle OCD

……

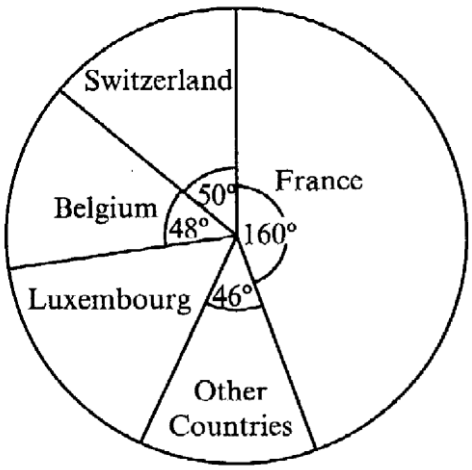
…… [2]

(c) Calculate the size of angle ABC

……

…… [1]

5. 2700 people work in one department of the European Parliament.
The pie chart shows where the people come from.



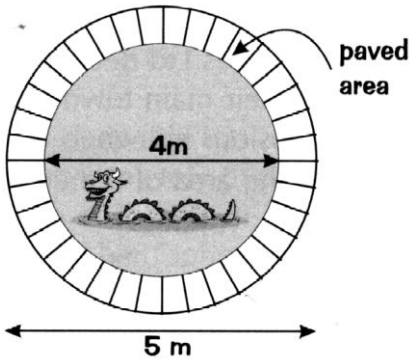
Calculate how many of the 2700 people came from Switzerland.

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…… [2]

6. In my garden, I have a circular pond which is surrounded by a ring shaped paved area. The pond is 35cm deep and is filled with water.



(a) Find the volume of water in the pond when it is full

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……

…… [3]

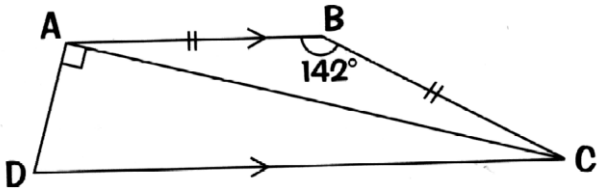
(b) Find the area of the paving surrounding the pond.

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…… [3]

7. ABCD is a trapezium where the AB = BC, angle ABC = 142°, angle DAC = 90° and the line AB is parallel to the line DC



(a) Calculate the size of angle BAC

……

……

…… [2]

(b) Calculate the size of angle ADC

……

……

…… [2]

8. A plane leaves Amsterdam at 0715 and flies at an average speed of 650km/hr to Paris, arriving at 0800. It takes off again at 0840 and flies at the same average speed to Nice arriving at 1005.

(a) How far is it from Amsterdam to Paris?

……

…… [2]

(b) How far is it from Paris to Nice?

……

…… [2]

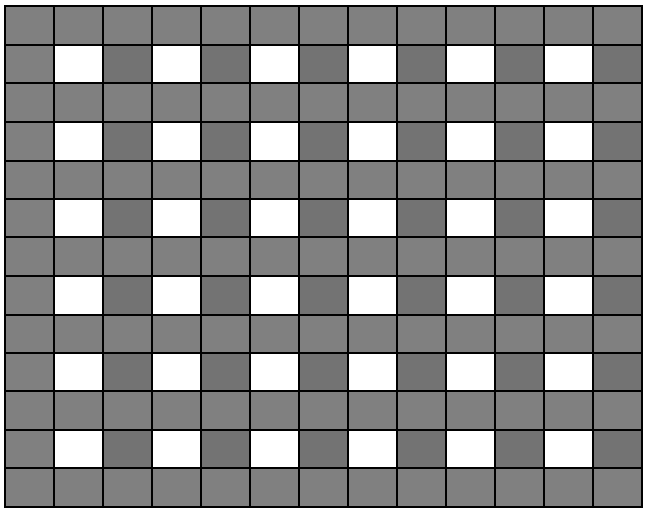
(c) What was the average speed for the whole journey?

……

……

…… [2]

9. A square tablecloth has a diagonal measurement of 130cm. Calculate the length of one side



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…… [4]

10. A lorry driver decided to monitor the time it took him to travel from Liverpool to Birmingham during one week. He recorded his results in a table:

	Trip one	Trip two	Trip three
Monday	1 hour 40 mins	1 hour 55 mins	2 hours 10 mins
Tuesday	3 hours 5 mins	1 hour 50 mins	2 hours 55mins
Wednesday	1 hour 20 mins	1 hour 30 mins	1 hour 40 mins
Thursday	1 hour 55 mins	1 hour 45 mins	2 hours 5 mins
Friday	1 hour 35 mins	1 hour 50 mins	1 hour 55 mins
Saturday	1 hour 35 mins		

(a) What was his mean journey time on Monday? Give your answer in hours and minutes

……

……

…… [2]

(b) What was his median journey time for the whole week?

……

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…… [2]

(c) What was his modal journey time for the whole week?

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…… [1]

11. Use trial and improvement to find the value of x in the equation

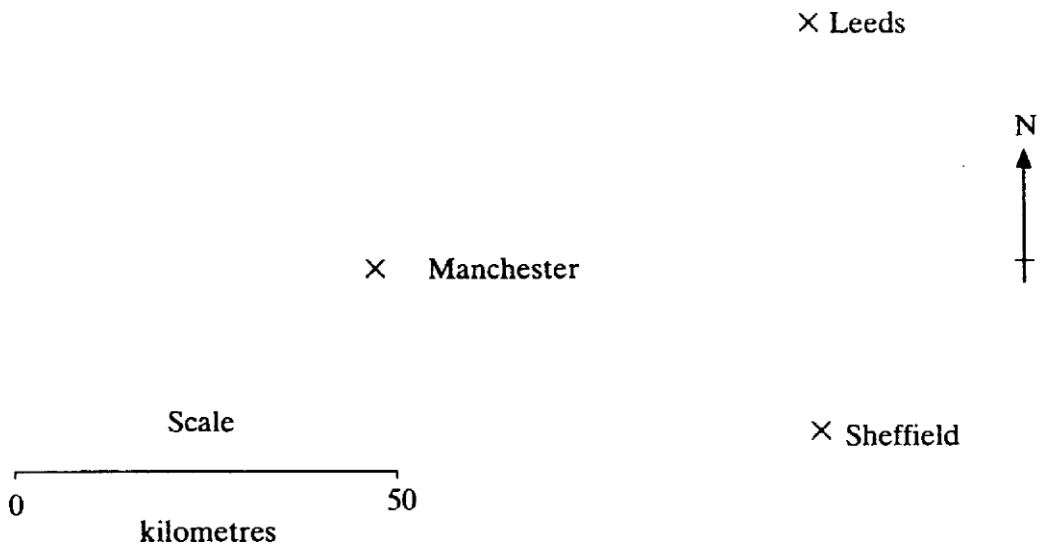
$x^3 - x^2 = 350$

Give your answer correct to **one** place of decimals.

[3]

x	$x^3 - x^2$	Comment
6	180	Too low
7	294	Too low

12. The scale drawing shows the position of three towns.



(a) What is the actual distance, in kilometres, between Manchester and Leeds?

……

…… [2]

(b) What is the bearing of Sheffield from Manchester?

……

…… [2]

(c) What is the bearing of Manchester from Leeds?

……

…… [2]

13. Use your calculator to evaluate the following questions. Give your answers correct to two places of decimals.

(a) $\dfrac{3.24 + 7.16}{2.32 + 3.75}$

……

……

…… [1]

(b) $\dfrac{3.24 + 7.16}{2.32} + 3.75$

……

……

…… [1]

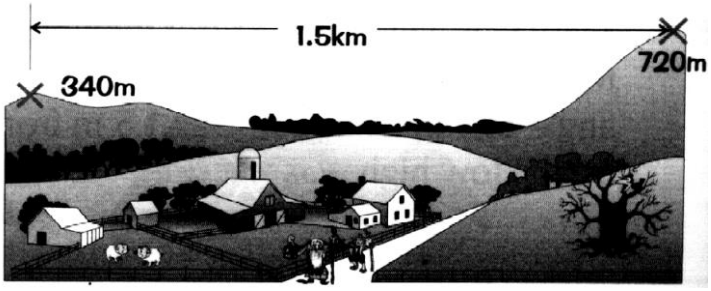
(c) $3.24 + \dfrac{7.16}{2.32 + 3.75}$

……

……

…… [1]

14. Two fell tops are 1.5km apart horizontally. One is 720m high and the other is 340m high.



(a) Calculate the difference in height between the two fell tops

……

…… [1]

(b) Calculate the angle of elevation looking from the lower to the higher fell.

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…… [3]

15. Solve the following equations

(a) $3x - 8 = 13$

……

……

…… [1]

(b) $5(x - 1) + 3(x - 4) = 7$

……

……

…… [2]

16. Solve the simultaneous equations

$3a - 7b = -1$

$2a + 3b = 30$

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…… [4]

17. The table gives the diameter and distance from the sun of some planets.

Planet	Distance from Sun in km	Diameter in km
Earth	1.5×10^8	1.3×10^4
Venus	1.085×10^8	1.2×10^4
Mars	2.28×10^8	6.8×10^3
Mercury	5.81×10^7	4.9×10^3
Jupiter	7.8×10^8	1.4×10^5
Neptune	4.52×10^9	4.9×10^4
Saturn	1.43×10^9	1.2×10^5

(a) Which planet listed in the table is furthest from the Sun?

……

……

…… [2]

(b) Using the information in the table, list the planets in order of size, from smallest to largest.

……

……

…… [2]

18. Here is a number pattern:

$1 \times 4 = 1^2 + 3$
$2 \times 5 = 2^2 + 6$
$3 \times 6 = 3^2 + 9$
$4 \times 7 = 4^2 + 12$

(a) Write down the next row of the pattern

……

…… [1]

(b) Write down the nth row of the pattern

……

……

…… [2]

19. A darts player scored 190 with 6 darts, the individual scores being as follows:

Dart 1 – treble 19

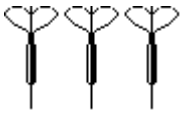
Dart 2 – treble 3

Dart 3 – treble 18

Dart 4 – single 20

Dart 5 – single 18

Dart 6 – double 16



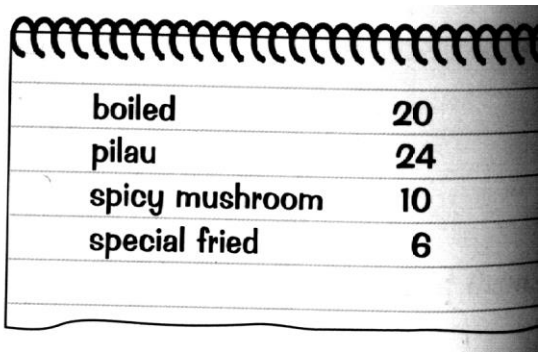
What is the mean score per dart? Give your answer to the nearest whole number.

……

……

…… [3]

20. The notepad below shows orders for 4 different sorts of rice at a local takeaway.



boiled	20
pilau	24
spicy mushroom	10
special fried	6

Based on this data, what is the probability that the next order of rice is:

(a) for pilau rice?

……

……

…… [2]

(b) for spicy mushroom or special fried rice?

……

……

…… [1]

(c) not for boiled rice?

……

……

…… [1]

21(a) Solve the inequality

$10 - 3w > 1$

……

…… [2]

(b) List all the integer values of y which satisfy the inequality

$y^2 - 10 < 17$

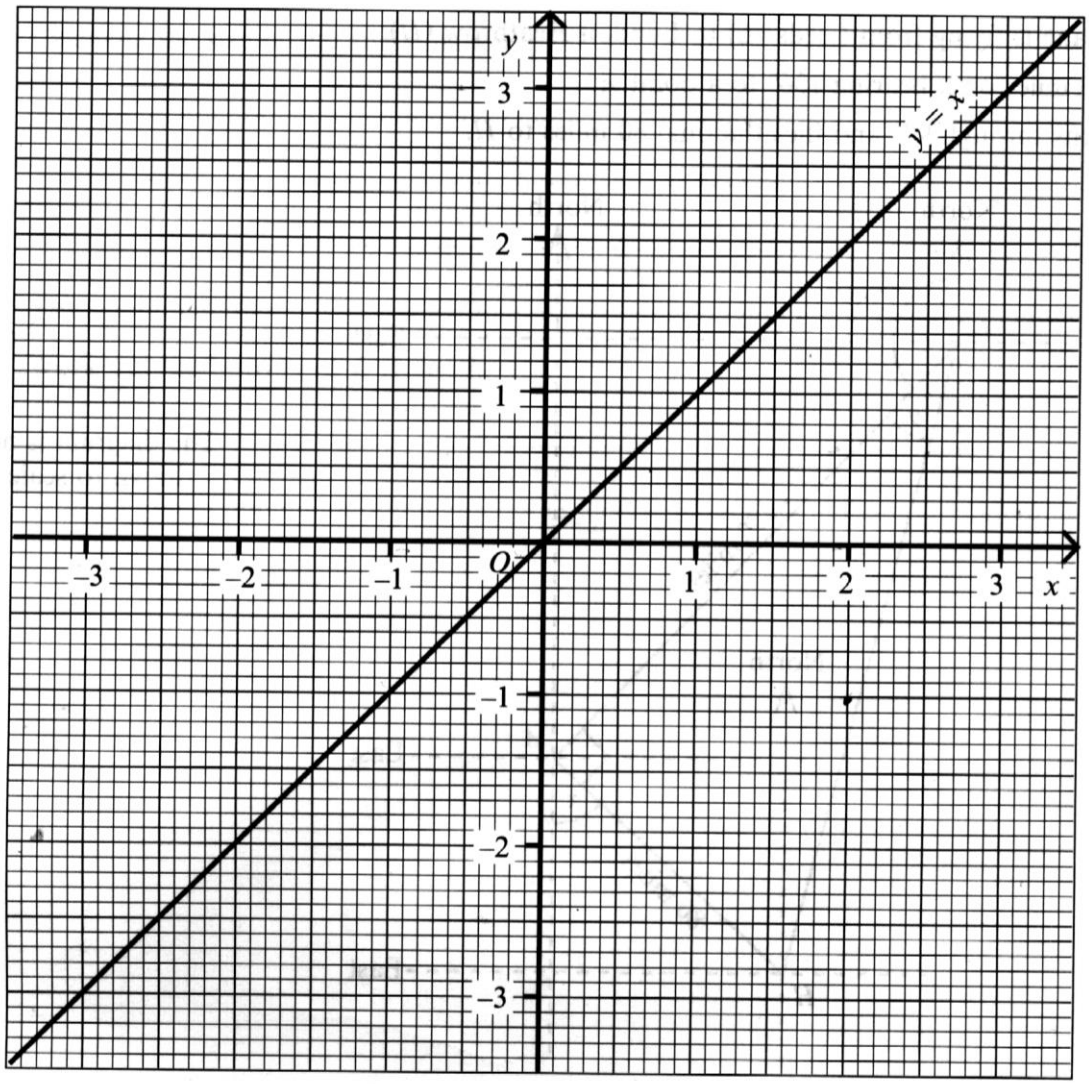
……

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…… [3]

Please turn over for next questions.

22. The line y =x has been drawn on the grid below.



(a) On this grid, draw the line y = 2x - 1 for values of x from -1 to 2 [2]

(b) Draw the image of y = 2x - 1 when it is reflected in the line y = x.
Label your image line L [2]

(c) Calculate the gradient of the line L

……

…… [2]

(d) For the line L write down the value of y when x = 0

…… [1]

(e) Write down the equation of the line L

……

……

…… [2]

23. Factorise the following expressions completely:

(a) $4a + 2b - 6c$

……

…… [1]

(b) $3g - 12gh$

……

…… [2]

(c) $x^2 - 7x + 12$

……

…… [2]

(d) Use your answer to part (c) to solve the equation

$x^2 - 7x + 12 = 0$

……

……

…… [2]

24. Given that $y = x^2 + 2x$

(a) Complete the table below,

x	0	1	2	3	4	5
y			8	15		

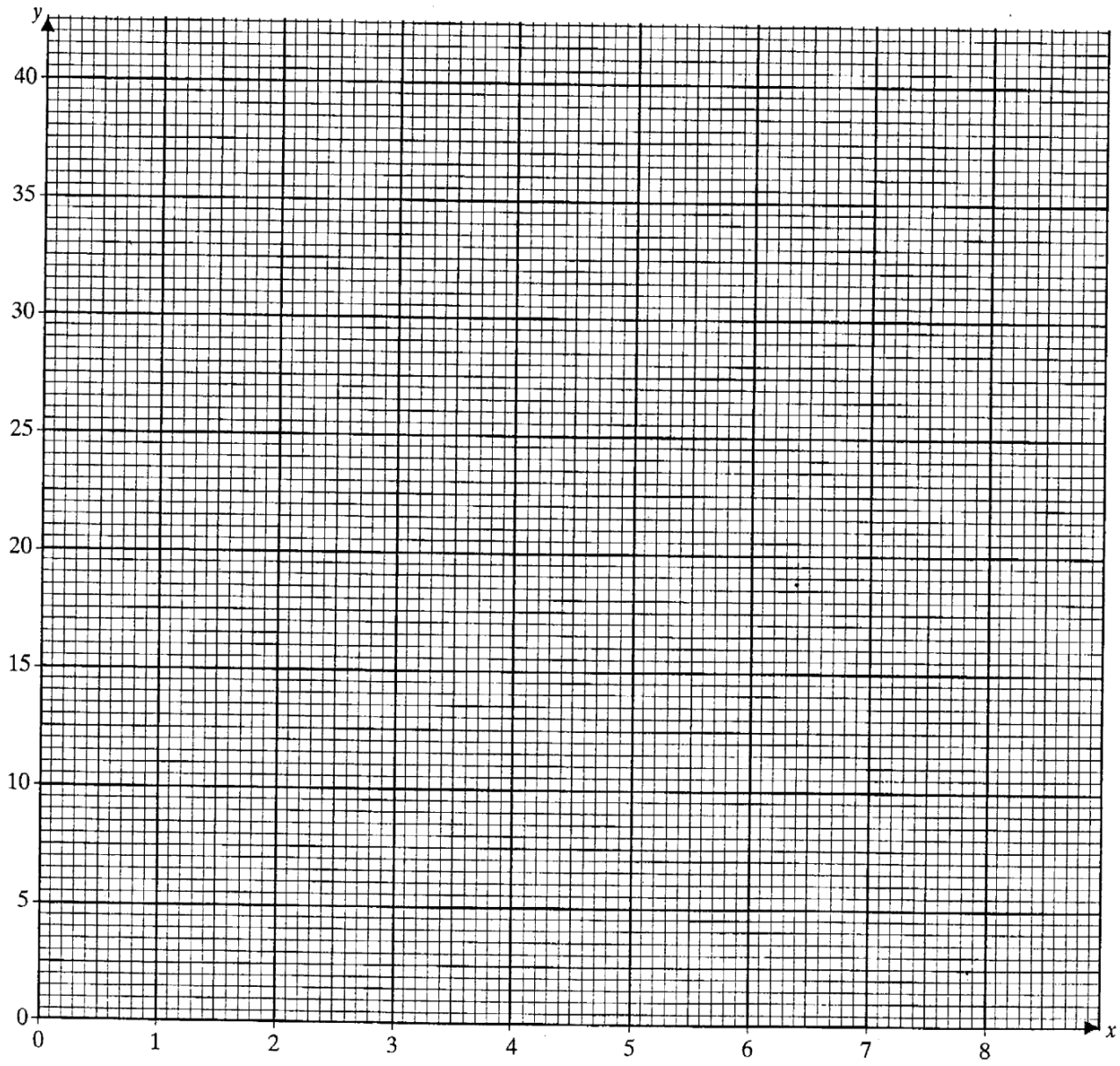
[2]

(b) Plot these points on the grid below and hence draw the graph of $y = x^2 + 2x$ [2]

(c) Use your graph to find the value of x when y = 30

…… [1]

Use graph over the page.



25. Expand the brackets and simplify:

(a) $2a(af + 3g)$

.....

..... [2]

(b) $(3x + 4)(2x - 3)$

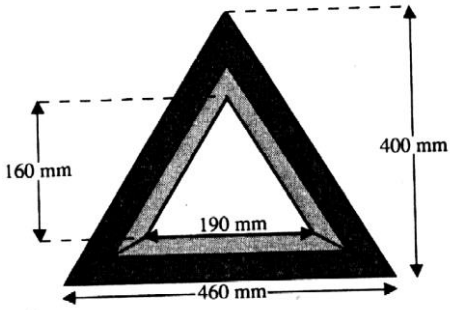
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..... [2]

26. Warning triangles are manufactured for a garage to the specifications shown.

If the sign consists of a plastic triangle, coloured in two shades of red, with a triangular hole in the middle, calculate the surface area of the plastic used in the triangle



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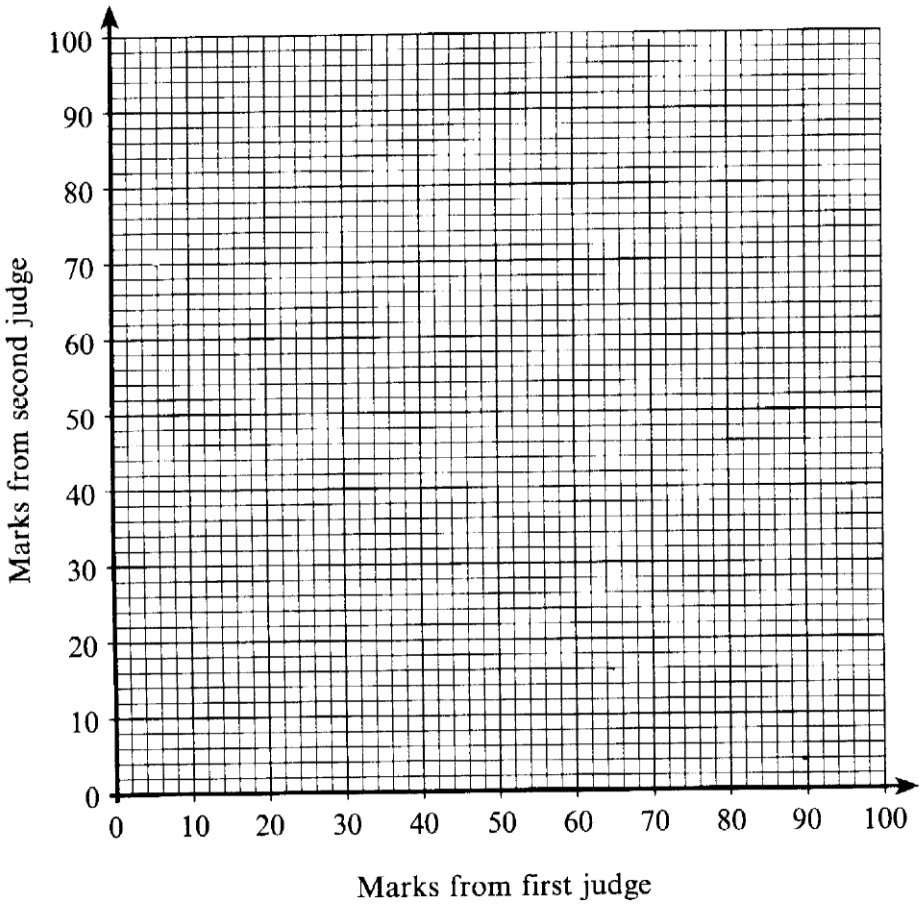
…… [3]

Please turn over for nest questions.

27. Ten people entered a craft competition.
Their displays of work were marked by two different judges.
The table shows the marks that they gave to each of the competitors.

Competitor	A	B	C	D	E	F	G	H	I	J
First judge	90	35	60	15	95	25	5	100	70	45
Second judge	75	30	55	20	75	30	10	85	65	40

(a) On the grid below, draw a scatter diagram to show this information. [3]



(b) Draw a line of best fit [1]

(c) A late entry was given 75 marks by the first judge.
Use your scatter diagram to estimate the mark that might have been given by the second judge. Show how you found your answer.

……

……

…… [1]

END OF EXAM

ANSWERS FOR PAST PAPER 4

1. 42	17. (a) Neptune (b) Mercury, Mars, Venue, Earth, Neptune, Saturn, Jupiter
2. a) $\frac{1}{18}$, (b) $\frac{1}{4}$	18.(a) $5 \times 8 + 5^2 + 15$ (b) $n \times (n+3) - n^2 + 3n$
3. (a) £950 (b £969 (c) £118.35 (d) £190.89	19. 32
4. (a) 40° (b)70° (c) 140°	20. (a) $\frac{2}{5}$ b) $\frac{4}{15}$ (c) $\frac{2}{3}$
5. 375	21. (a) $w < 3$ (b)-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5
6.(a) $4.4m^3$ (b) $7.07m^2$	22. (a) Line passes through (2,3) and (-1, -3) (b) Line passes through (1,1) and (-1,0) (c) $\frac{1}{2}$ (d)$\frac{1}{2}$ (e)$y = \frac{1}{2}x + \frac{1}{2}$ or $2y = x + 1$
7. (a) 19° (b) 71°	23. (a) $2(2a + b - 3c)$ (b)$3g(1 - 4h)$ (c) $(x - 3)(x - 4)$, (d) either $x = 3$ or $x = 4$
8. (a) 487.5 km (b) 920.83 km (c) 497 km/hr	24. (a) 1.71 (b)8.23 (c)4.42
9. 91.92cm	25. (a)$2a^2f + 6ag$ (b)$6x^2 - x - 12$
10. (a) 1 hour 55 mins, (b) 1 hour 50 mins (c) 1 hour 55 mins	26. $76800mm^2$
11. 7.4	27. (a) graph, (b) Line passes through (0,6) and (100,85) or thereabouts (c)approximately 65
12. (a) 65km, (b) 110°, (c) 240°	
13. (a) 1.71, (b) 8.23, (c) 4.42	
14. (a) 380m, (b) 14.22°	
15. (a) $x = 7$, (b) $x = 3$	
16. $a = 9$, $b=4$	

PAST PAPER 5

Edge Hill University

Paper 2
2004

Two and a half hours

Name .....

ATTEMPT ALL QUESTIONS

- Show all your working in the space provided and make sure your answer is clear.
- It is assumed that you have a scientific calculator, ruler and protractor.
- If your calculator does not have a π button, take the value of π to be 3.142
- Diagrams are not necessarily drawn to scale.
- The marks for each question are given in brackets by the side of the question.
- Marks may be given for method even if your answer is wrong.
- The total marks available are 120.

Calculator Questions

1. A teacher has a small group of pupils in a special needs class. Their ages are:

12 years 4 months	11 years 6 months	11 years 11 months
11 years 8 months	12 years 3 months	12 years 1 month
12 years 1 month	11 years 6 months	

(a) What is the median age of the children?

……

…… [1]

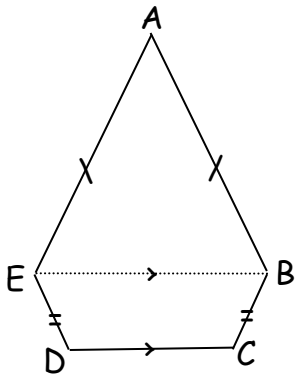
(b) What is the mean age of the children?

……

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…… [2]

2. ABCDE is a shape with AB = AE and DE = BC. BE is parallel to CD.



(a) Show any lines of symmetry for the shape ABCDE on the diagram

[1]

(b) What is the mathematical name given to the shape ABE?

…… [1]

(c) What is the mathematical name give to the shape BCDE?

…… [1]

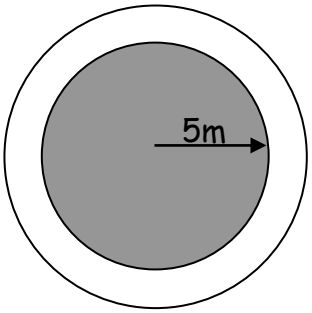
(d) If angle BAE = 40° and angle BCD = 100°, then calculate the size of angle ABC.

……

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…… [3]

3. The council surround a circular flower bed with a concrete edge.



The radius of the flower bed is 5 metres and the concrete extends for a further metre.

(a) Calculate the area of the flower bed.

……

……

…… [2]

(b) Calculate the area of the flower bed and the concrete surround together.

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…… [1]

(c) Find the area of the concrete surround.

……

…… [1]

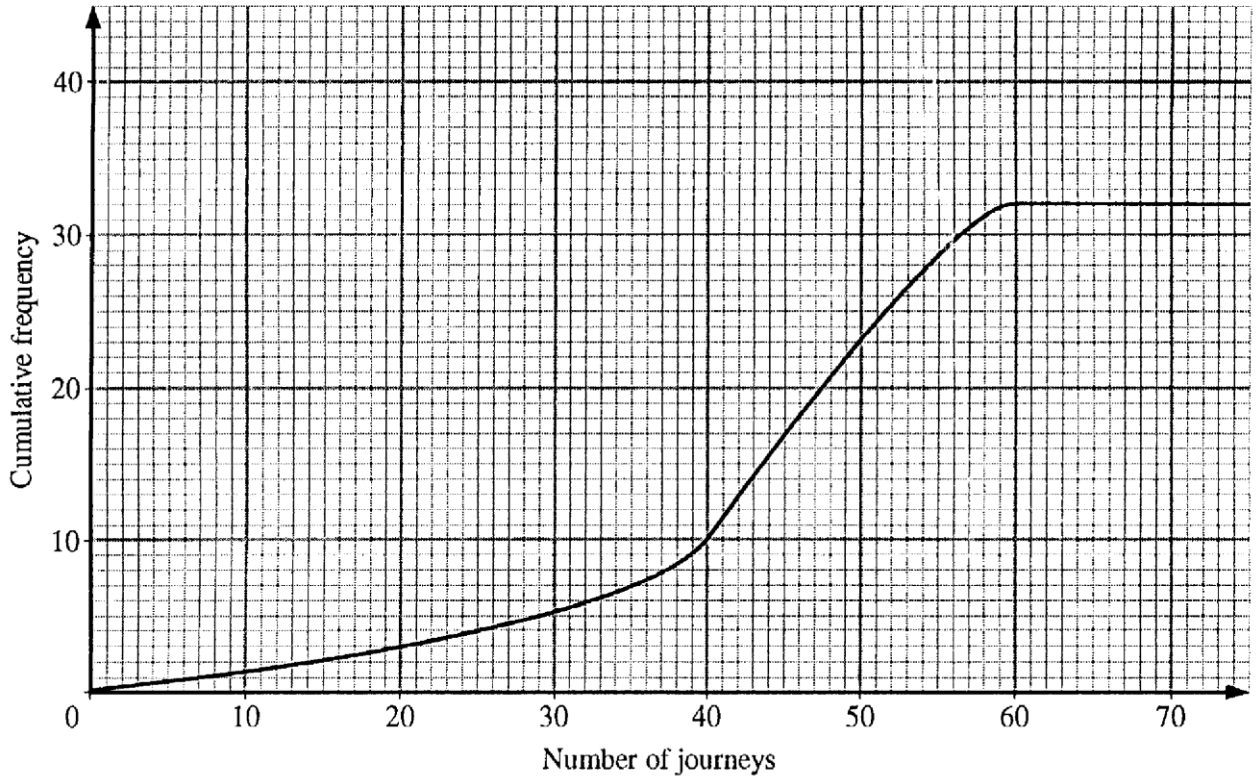
(d) If the concrete surrounding the flower bed is 8cm thick, calculate the volume of concrete used for the job. Remember to state the units in your answer.

……

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…… [3]

4. The number of journeys made using public transport by a group of people in one month are shown in the graph.



(a) Find the interquartile range

……

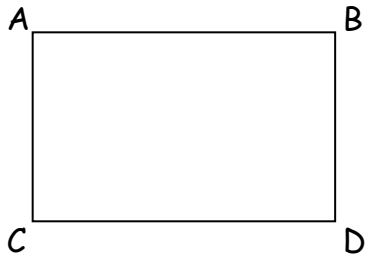
…… [2]

(b) Use the graph to estimate how many people make more than 55 journeys a month on public transport.

……

…… [2]

5.



ABCD is a rectangle with AB:BD = 8:5.

If the perimeter of the rectangle is 78 cm, find the length of AB.

……

……

…… [3]

6. A shopkeeper buys a box of 24 chocolate bars for £6.30. She sells them at a profit of 45%, rounding the price to the nearest penny. How much does she sell each bar for?

……

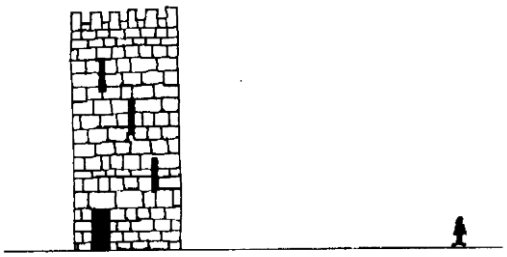
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…… [3]

PTO to continue

7.



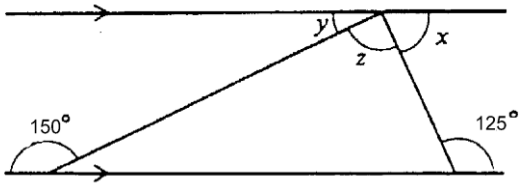
A boy is 90 m due East from the foot of a tall tower and on level ground. He measures the angle of elevation of the top of the tower as 38° from the ground at his feet. Calculate the height of the tower.

……

……

…… [3]

8.



(a) Find the value of ***x*** in the diagram.

……

…… [1]

(b) Find the value of ***y*** in the diagram.

……

…… [1]

(c) Find the value of ***z*** in the diagram.

……

…… [1]

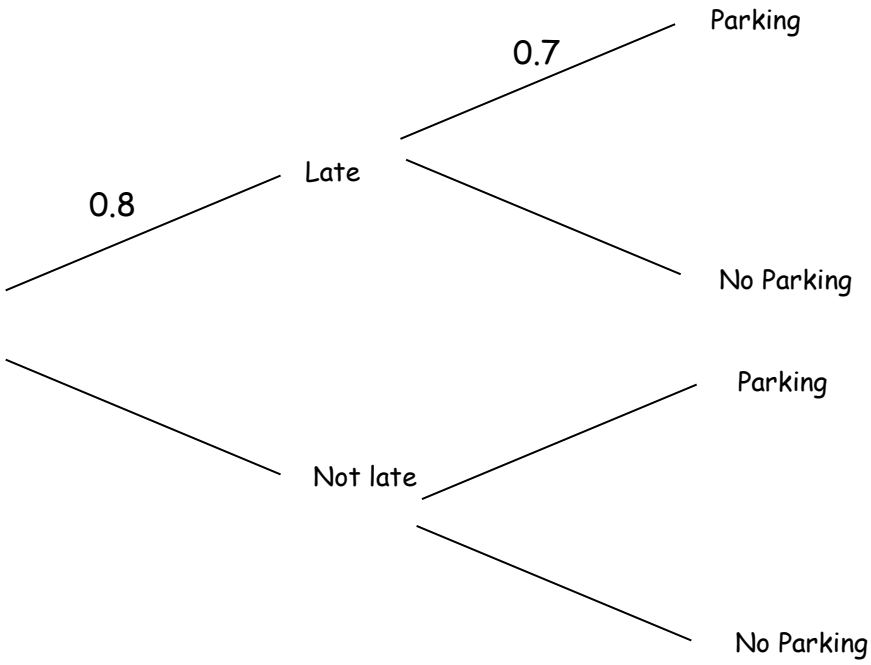
9. The probability that I am late for work on a Monday is 0.8 and the probability that I find a parking space within 5 minutes of arriving at work is 0.7.

(a) What is the probability that I don't find a parking space within the first 5 minutes of arriving at work?

……

…… [1]

(b) Complete the tree diagram to show the possible outcomes.



[2]

(c) Use the tree diagram to find the probability that I'm both on time and find a parking space within the first 5 minutes.

……

……

…… [2]

10. Use trial and improvement to find the value of x in the equation

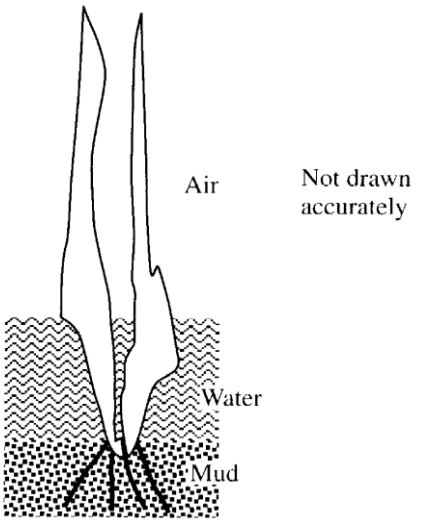
$$x^2 - 3x = 150$$

Give your answer correct to one place of decimals.

x	$x^2 - 3x$	Comment
12	108	Too low
13	130	Too low

[3]

11. A water plant has $\frac{7}{12}$ of its length in the air. Nineteen centimetres of its length are in the water. $\frac{1}{6}$ of its length is in the mud. Calculate the total length of the plant.



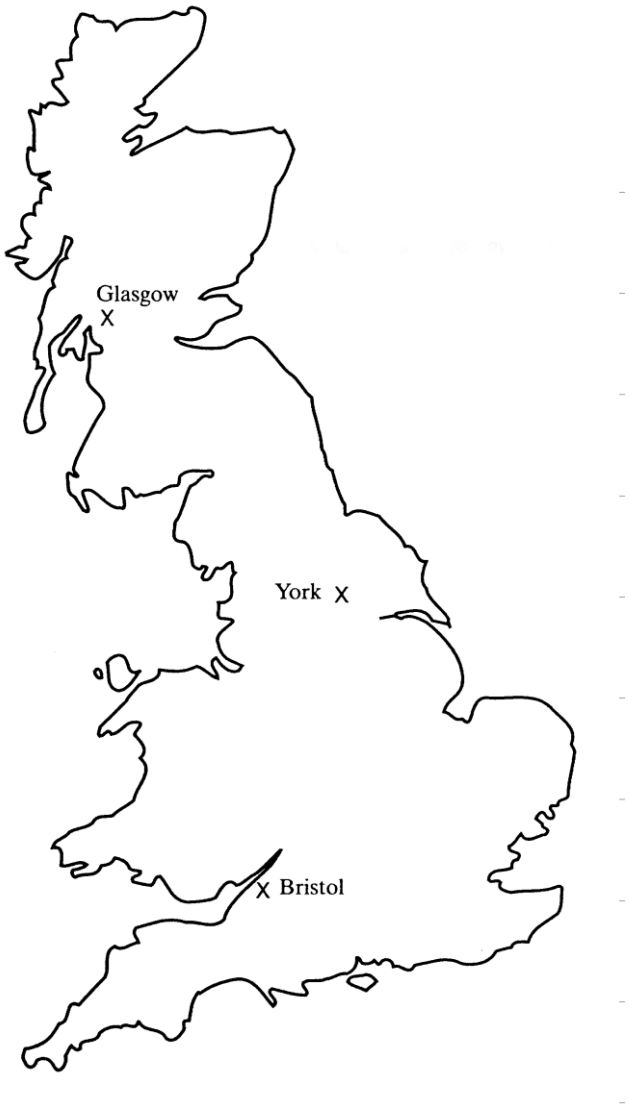
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…… [2]

12.



North

(a) A plane flies from Bristol to Glasgow. Use the map to find the flight bearing.

……

…… [1]

(b) A ship at sea is on a bearing of 110° from York and 070° from Bristol. Show its position on the map.

[2]

13. A group of 50 pupils were asked how long they had spent on their homework on the previous evening. Their answers are recorded in the table below.

Time spent on homework (t minutes)	Number of pupils
$0 < t \leq 30$	6
$30 < t \leq 60$	13
$60 < t \leq 90$	9
$90 < t \leq 120$	12
$120 < t \leq 150$	10
Over 150	0

(a) What is the modal class?

……

…… [1]

(b) Calculate the estimated mean time taken on homework.

……

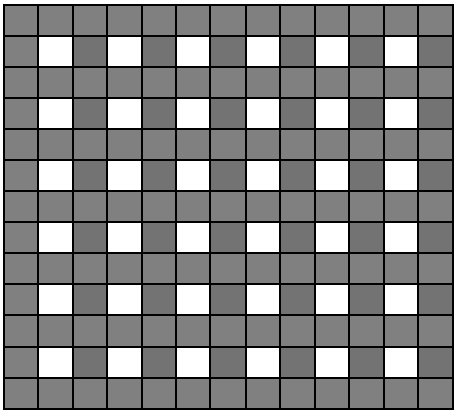
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…… [3]

14. A square tablecloth has a diagonal measurement of 190cm. Calculate the length of one side



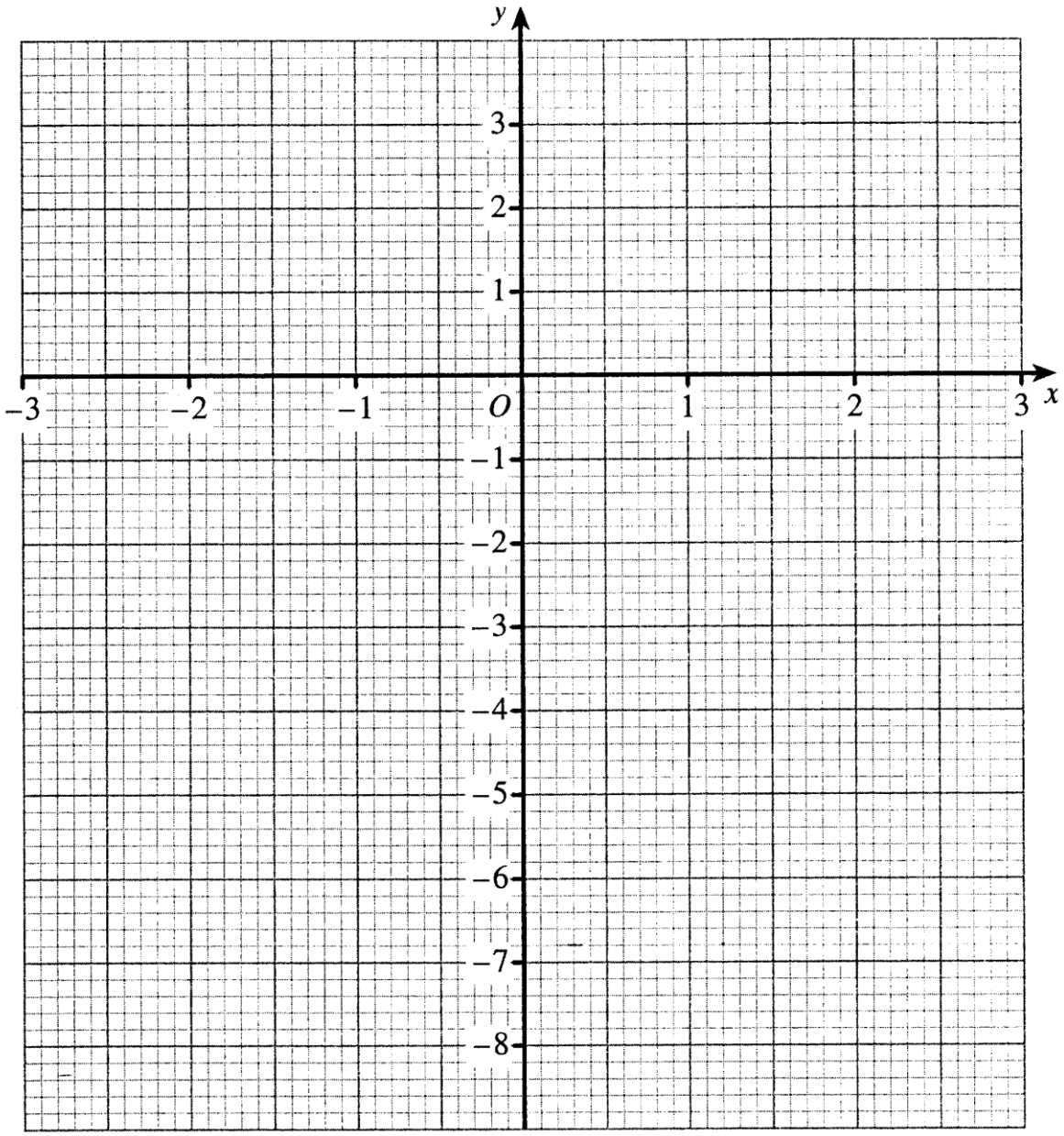
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…… [4]

15.



(a) Draw a graph of the line $y = -x$ on the grid above. [2]

(b) Complete the table for the graph of $y = x^2 - 7$

x	-3	-2	-1	0	1	2	3
y	2	-3					

[2]

(c) Plot the points from your table onto the graph. [2]

(d) Use your graph to find a solution to the simultaneous equations

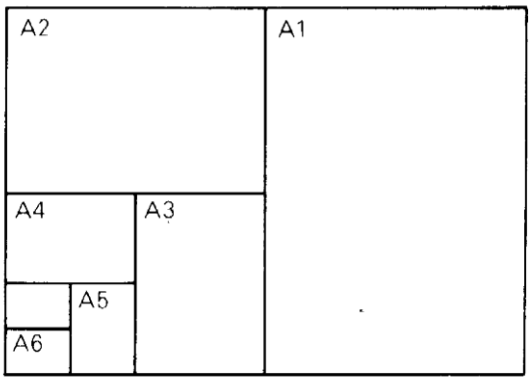
$y = x^2 - 7$

$y = -x$

……

…… [2]

16. One method used for measuring paper identifies the different sizes of paper by using the letter A and then a number. A6 paper has half the area of A5; A5 paper has half the area of A4 and so on. The diagram shows how a sheet of A0 could be split up.



(a) If A0 paper has an area of $1m^2$, what is the area of a piece of A4 paper? Give your answer in cm^2.

……

…… [2]

(b) How many sheets of A6 paper can be made from a sheet of A0?

……

…… [2]

(c) How many sheets of An paper can be made from a sheet of A0, where n is the nth division of the paper?

……

…… [2]

17. Complete the multiplication table below:

X	-3	2		-9
-1		-2	4	
	9		12	27
5		10	-20	-45
7	-21	14		

[4]

18. Mr Jones monitored the distance that employees in his company had to drive on business in one week:

Employee A 152 miles
Employee B 608 miles
Employee C 332 miles
Employee D 348 miles

If he represents this information on a pie chart, calculate the size of the angle needed to represent employee B.

……

……

…… [2]

19.

Line 2 $2^2 - 4 = 2 \times 0$
Line 3 $3^2 - 6 = 3 \times 1$
Line 4 $4^2 - 8 = 4 \times 2$
Line 5 $5^2 - 10 = 5 \times 3$

(a) Write down line 1 of this pattern

…… [1]

(b) Write down the nth line of this pattern

…… [2]

20. Jake uses this rhyme to convert between pints and litres:

A litre of water's a pint and three quarters

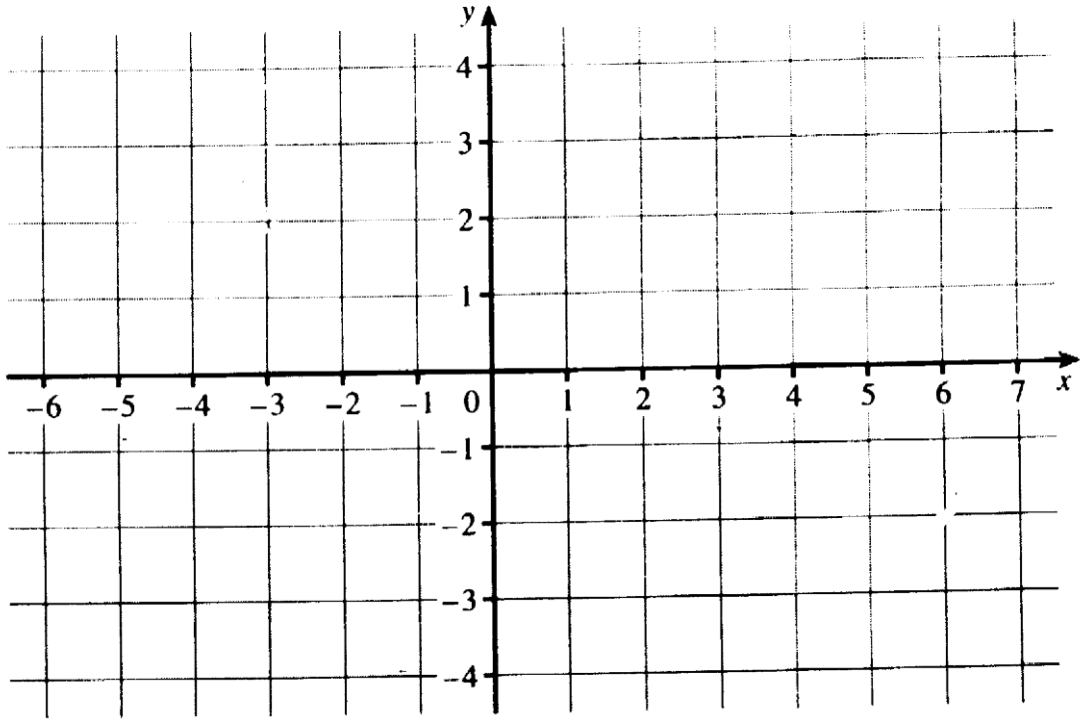
If the price of petrol increases by 2p per litre and the tank in Jake's car holds 10 gallons, how much more will it cost for him to buy a full tank of fuel? Give your answer to the nearest penny. Remember that there are 8 pints in a gallon.

……

……

…… [3]

21. The line y = mx + c passes through the points (6,0), (3,-1) and (-3,-3)



(a) Plot the points on the graph provided and draw in the line y = mx + c.

[2]

(b) Find the value of c

……

…… [1]

(c) Find the value of m

……

…… [2]

22. Solve the following equations

(a) $5x - 7 = 33$

……

…… [1]

(b) $5(x - 1) + 2(x - 5) = 13$

……

……

……

…… [2]

23(a) Solve the inequality

$8 - 2w < 14$

……

……

…… [2]

(b) List all the whole number solutions of the inequality

$x^2 \leq 4$

……

…… [3]

24. Write these numbers in order, smallest first. Remember to show all your working.

$0.5, \quad \frac{4}{9}, \quad 46\%$

……

……

…… [2]

25. Solve the simultaneous equations

$3x + 5y = -1$
$2x - 4y = 14$

……

……

……

……

……

……

……

……

…… [4]

26(a) Around the world, there are 1,500,000,000 people who don't have access to clean drinking water. Write this number in standard form.

……

…… [2]

(b) 2.5×10^7 people die each year from drinking unclean water. Write this as an ordinary number

……

…… [1]

(c) What percentage of people who don't have access to clean water, die each year?

……

……

…… [2]

27. Factorise the following expressions:

(a) $3a + 9b - 6c$

……

…… [1]

(b) $5g^2 - 15gh$

……

…… [2]

(c) $x^2 - 2x - 15$

……

…… [2]

(d) Use your answer to part (c) to solve the equation

$x^2 - 2x - 15 = 0$

……

……

…… [2]

28(a) Here are the first five terms in a series

3 7 11 15 19

Find the nth term in the series

……

…… [2]

(b) Find the nth term in the series

-3 0 5 12 21

……

……

…… [3]

29. **5 8 15 18 23 48 51**

From the numbers in the box, write down

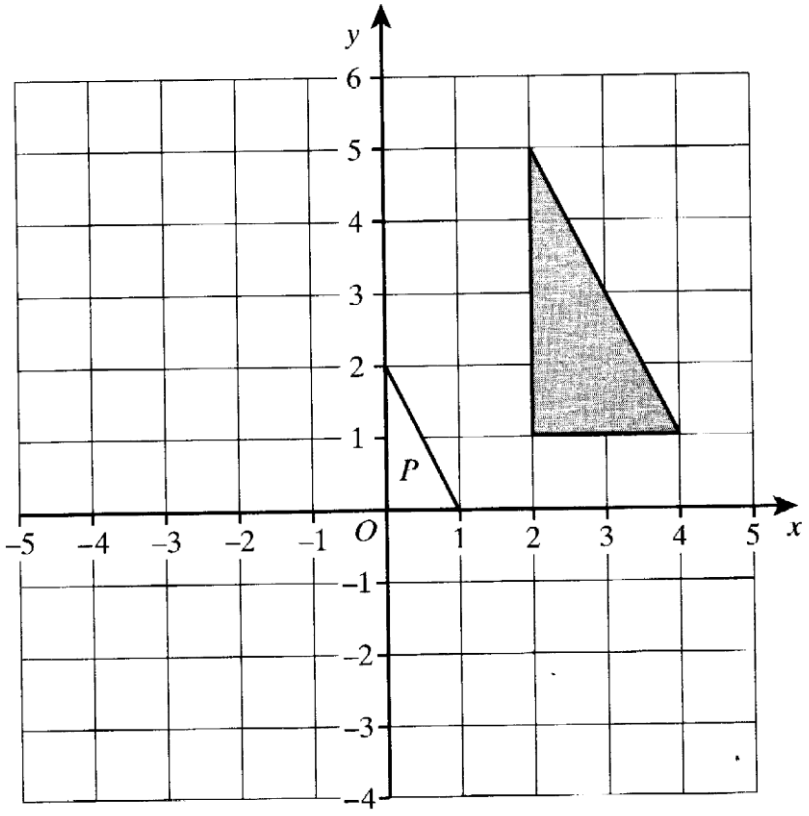
(a) Two prime numbers

…… [2]

(b) A cube number

…… [1]

30.



Triangle P is an enlargement of the shaded triangle.

(a) What is the scale factor of the enlargement?

……

…… [1]

(b) Find the coordinates of the centre of enlargement.

……

…… [1]

END OF EXAM

ANSWERS FOR PAST PAPER 5

1.(a) 12 years, (b) 11years 11months	17. -4, 3, 9, -3, -6, -15, -28, -63
2. (a) one vertical line (b) isosceles triangle (c) trapezium, (d) 150^o	18. 152^o
3. (a) $78.54cm^2$ (b) $113.1cm^2$ (c) $34.56cm^2$ (d) $2.76m^3$	19. (a) $1^2 - 2 = 1 \times -1$ (b) $n^2 - 2n = n \times (n - 2)$
4.(a) 14, (b) 3	20. 91p
5. 24cm	21. (a) on graph (b) -2 (c) $\frac{1}{3}$
6. 38p	22. (a) x = 8, (b) x = 4
7. 70m	23. (a) w › -3 (b) -2, -1, 0, 1, 2
8. (a) 55^o (b) 30^o (c)95^o	24. 0.444, 0.46, 0.5
9. (a) 0.3 (b) on time 0.2, spaces/ no spaces 0.7, 0.3, 0.7, 0.3 (c) 0.14	25. x=3, y=-2
10. x= 13.84	26. (a) 1.5×10^9 (b) 25 000 000 (c) 1.7%
11. 78cm	27. (a) 3(a + 3b -2c) (b) 5g(g – 3h) (c) (x – 5)(x + 3) (d) x = 5 or x = -3
12. (a) $345^o \pm 2^o$	28. (a) 4n-1 (b) n^2 - 4
13. (a) The modal class is $30 < t \leq 60$ (b) $\frac{\sum fx}{\sum f}$ $\frac{90+583+675+1260+1350}{50} = \frac{3960}{50} = 79.2$	29 (a) 5 and 23 (b) 8
14. $x^2 + x^2 = 190^2$ $2x^2 = 36100$ so $x^2 = 18050$ X= 134.4 (1d.p)	30.(a) Enlargement scale factor 2 (b) (-2, -1)
15.b) x -3 -2 -1 0 1 2 3 Y 2 -3 -6 -7 -6 -3 2 d) x= 2.2, y=-2.2	
16. (a)$625cm^2$, (b) 64 (c)2^n	

PAST PAPER 6

Edge Hill University

Paper 3
2004

Two and a half hours

Name ……

ATTEMPT ALL QUESTIONS

- Show all your working in the space provided and make sure your answer is clear.
- It is assumed that you have a scientific calculator, ruler and protractor.
- If your calculator does not have a π button, take the value of π to be 3.142
- Diagrams are not necessarily drawn to scale.
- The marks for each question are given in brackets by the side of the question.
- Marks may be given for method even if your answer is wrong.
- The total marks available are 120.

Calculator Questions

1. List these numbers from smallest to largest. Remember to show all your working.

$$\frac{5}{7}, \quad \frac{7}{9}, \quad \frac{3}{4},$$

……

……

……

…… [3]

2. Nadia is paid a basic rate of £4.90 per hour for a 35 hour week.
Overtime is paid at $1\frac{1}{2}$ times the basic rate.
In one week her total pay was £230.30.
Calculate how many hours of overtime she had worked

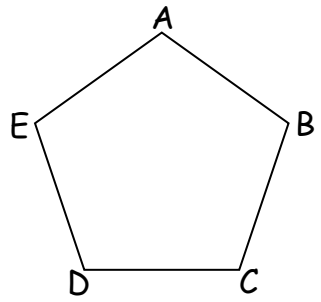
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…… [2]

3(a) ABCDE is a regular pentagon.



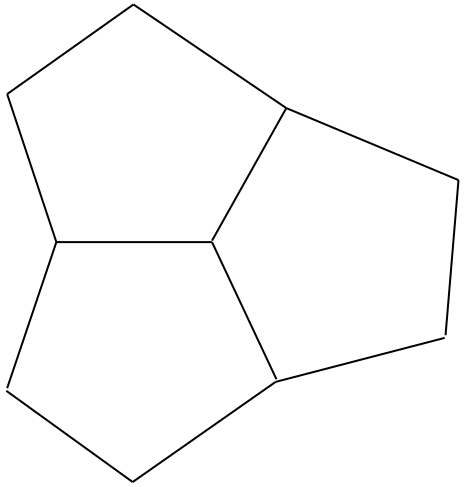
Calculate the size of angle A.

……

……

…… [2]

(b) Jane sketches a pattern of tessellating tiles which are regular pentagons.



Is her assumption that regular pentagons will tessellate correct? Explain how you got your answer.

……

……

…… [1]

4. Solve the following equations: Do not use a trial and improvement method.

(a) $4a - 7 = 13$

……

……

…… [2]

(b) $3f + 15 = 5f + 21$

……

……

…… [2]

(c) $\frac{2h + 4}{9} = h - 5$

……

……

……

……

…… [3]

5. (a) A camera is in a sale with 12% off the recommended price. If the recommended price was £135, how much will the camera cost now?

……

……

……

…… [2]

(b) A tripod is in the same sale for £13.20. what was its original price?

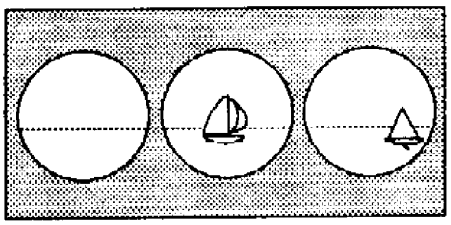
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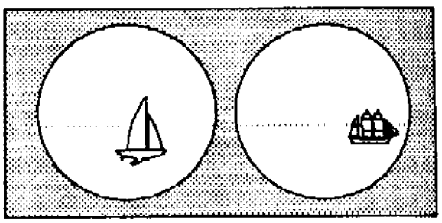
……

…… [3]

6. Two porthole designs are being considered for use in a cabin panel of a ship



A: radii 35 cm



B: radii 45 cm

Design A consists of three portholes, each of radius 35 cm.
Design B consists of two portholes each of radius 45 cm.

(a) Calculate the area of one of the windows in panel A

……

……

…… [2]

(b) Calculate the total window area for panel A

……

…… [1]

PTO for next part of question.

(c) Which of the two porthole designs would let in most light? Show all your working clearly.

……

……

……

…… [3]

7. The mean weight of six parcels is 4.2 kg. When another parcel is added, the mean weight is increased to 5.1 kg. What is the weight of the seventh parcel?

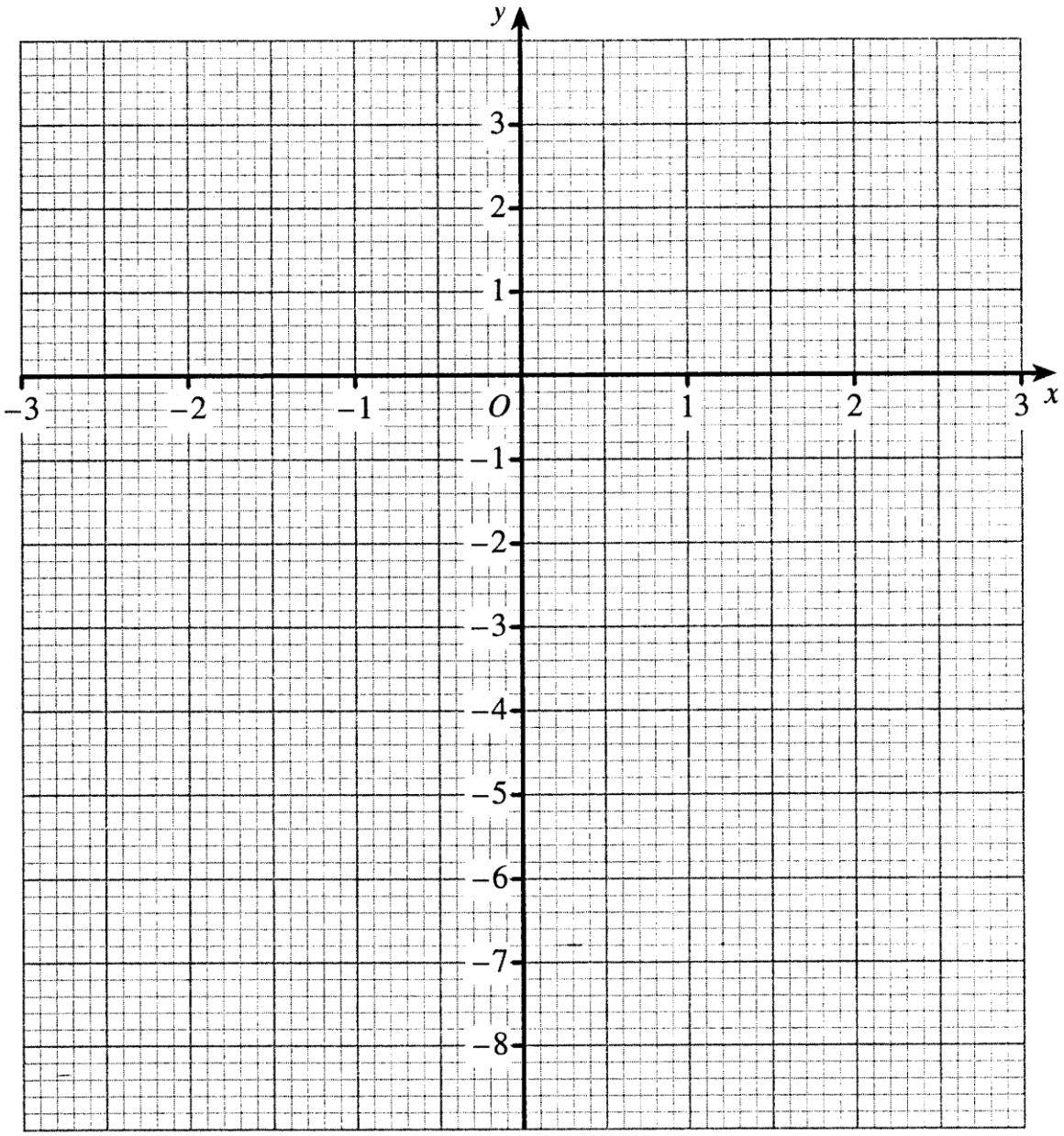
……

……

……

…… [3]

8. ABC is a triangle with A at (-3,2). B at (-1,3) and C at (-1, -2)



(a) Plot the points A,B and C and draw in the triangle ABC.

[2]

(b) Calculate the area of triangle ABC

……

……

…… [3]

(c) The triangle ABC is reflected in the line y = -3. Draw the image of the triangle after this transformation. Label it A'B'C'

[3]

(d) The image of ABC after an enlargement is at A″ ($-\frac{1}{2}, \frac{1}{2}$), B″ ($\frac{1}{2}$,1) and C″ ($\frac{1}{2}$, $1\frac{1}{2}$). Draw this new triangle on the diagram and give the scale factor of the enlargement.

……

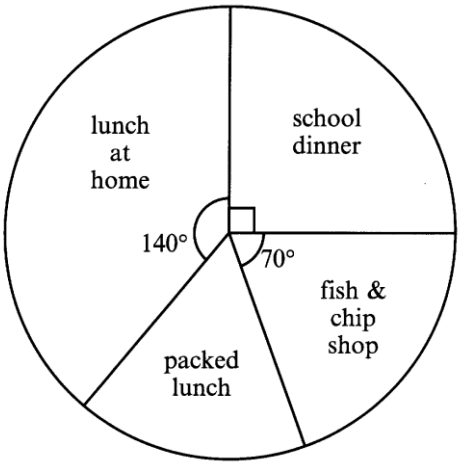
…… [2]

(e) Find the coordinates of the centre of enlargement.

……

…… [2]

9. The teachers in a secondary school did a survey to find out what pupils in their school did for lunch one day. They asked a total of 900 pupils. The results are shown in the pie chart below.



(a) How many pupils had lunch at the fish and chip shop?

……

……

…… [2]

(b) How many had a packed lunch?

……

……

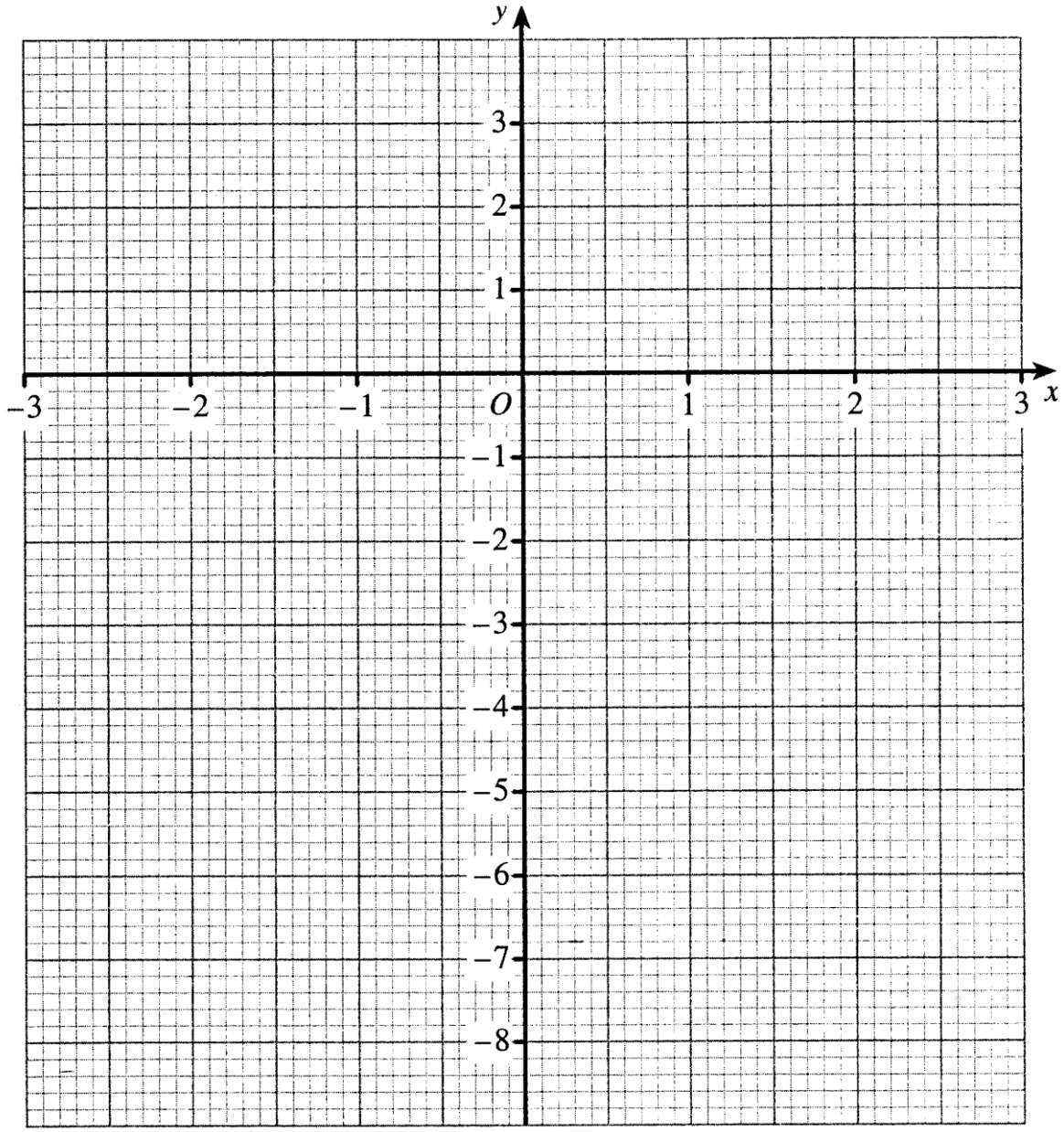
…… [2]

10 (a). Complete the table for the graph of $y = x^2 - 2x - 7$

x	-2	-1	0	1	2	3
y	1	-4				

[2]

(b) Draw the graph on the grid.



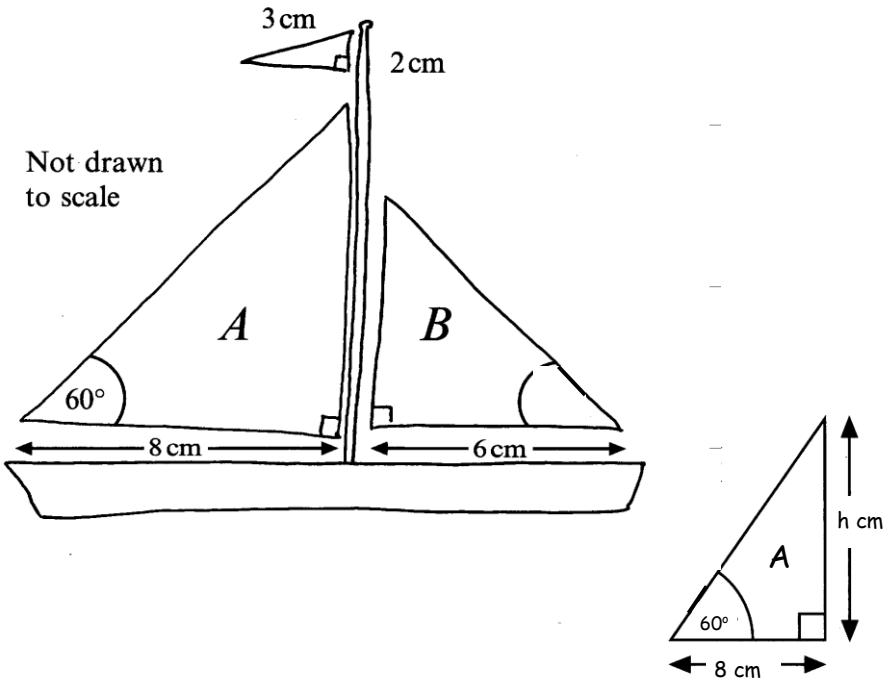
[3]

(c) **Use your graph** to solve the equation $x^2 - 2x - 7 = -5$

……

…… [2]

11. David sketches a toy boat.



(a) Calculate the height h of sail A.

.....

.....

.....

.....

..... [3]

(b) Sail B is 4.5 cm high. Calculate the perimeter of the sail.

.....

.....

.....

.....

..... [4]

12.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

John and Kate were playing a guessing game. Kate thought of a number between 1 and 100 which John had to guess. John was allowed to ask 5 questions, which are listed with Kate's responses in the table below.

John's Questions	**Kate's Responses**
Is it prime?	No
Is it odd?	Yes
Is it less than 50?	No
Is it a multiple of 3?	Yes
Is it a multiple of 7?	Yes

What is the number that Kate thought of?

……

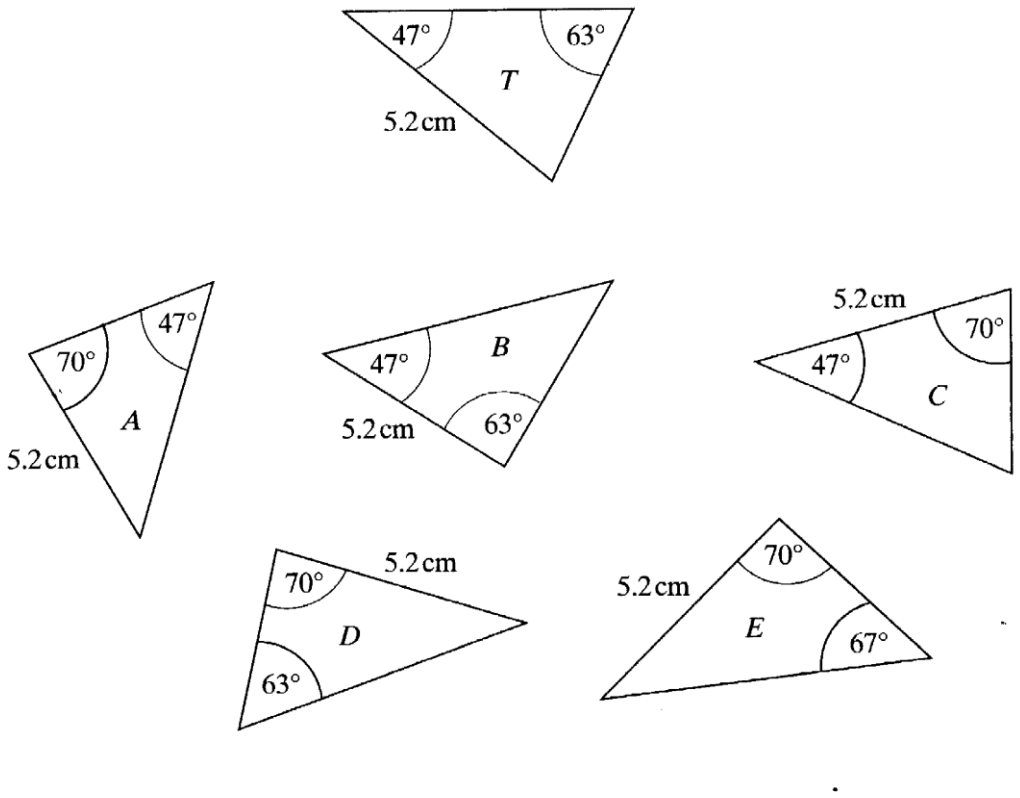
…… [3]

13. Join up all the pairs of equivalent expressions.

$2a(a + 4b)$	$2a^2 + 4b$
$2(a^2 + 2b)$	$12ab + 27a^2$
$12ab + 9a$	$2a^2 + 8ab$
$3a(4b + 9a)$	$3a(4b + 3)$

[3]

14.



Which of the triangles A, B,C, D and E are congruent to triangle T?

……

…… [2]

15. Solve the following simultaneous equations. Do not use a trial and improvement method.

$4a + 5b = 22$
$3a + 2b = 6$

……

……

……

……

…… [4]

16. In the box are six numbers written in standard form.

7.5×10^4	8.1×10^5	9.3×10^{-3}
6.25×10^{-1}	8.16×10^3	5.37×10^{-2}

(a) Write down the largest number.

…… [1]

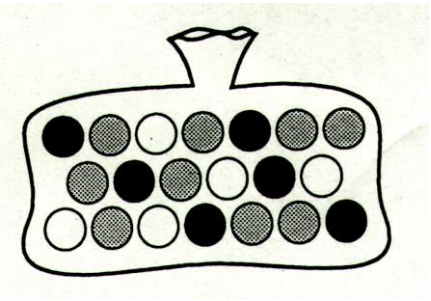
(b) Write down the smallest number.

…… [1]

(c) Write your answer to (b) as an ordinary number.

…… [1]

17. A bag contains a total of 20 beads. There are 6 red beads, 9 blue beads and 5 white beads.



(a) A bead is taken at random from the bag. What is the probability that it is a blue bead?

……

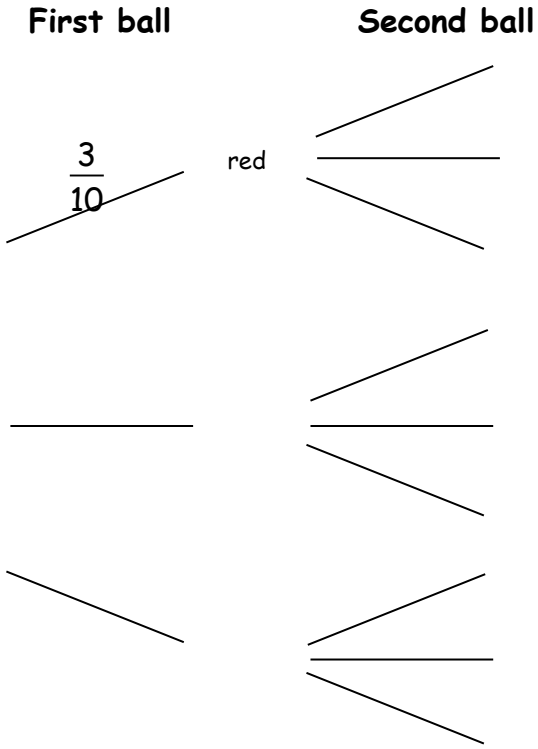
…… [1]

(b) A bead is taken at random from the bag. What is the probability that it is not a white bead?

……

…… [1]

(c) A bead is taken at random from the bag and **not** replaced. A second bead is then taken from the bag. Complete the tree diagram to show the possible outcomes.



[3]

(d) Use the tree diagram to determine the probability that both of the balls are white.

……

……

…… [2]

(e) Use the tree diagram to determine the probability that at least one of the balls is white.

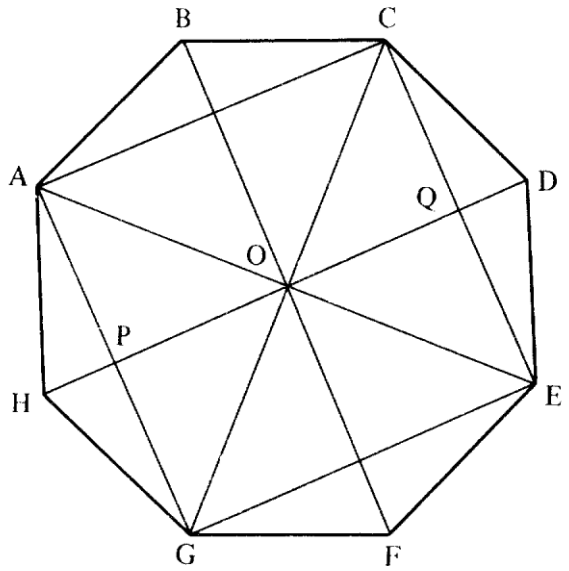
……

……

……

…… [3]

18. ABCDEFGH is a regular octagon.



(a) Describe the figure AOGH.

…… [1]

(b) Describe the figure OPGE

…… [1]

(c) Calculate the size of angle COD

…… [1]

19. Make p the subject of the formula

$$\frac{2(p - 5)}{6} = r$$

……

……

……

…… [2]

20. Solve the following inequalities:

(a) $2p - 5 > -11$

……

…… [1]

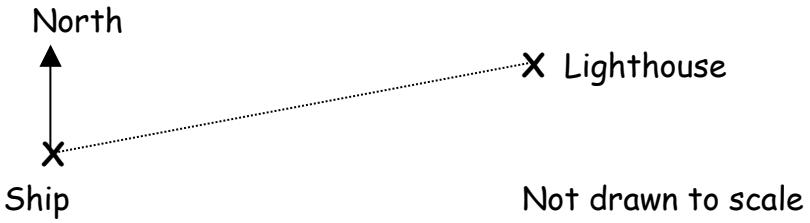
(b) $6 - 3x < -6$

……

……

…… [2]

21.



A captain of a ship at sea spots a lighthouse on a bearing of 085° from the ship. What is the bearing of the ship from the lighthouse?

……

……

…… [2]

22. (a) Factorise the expression

$x^2 + 3x - 10$

……

……

…… [2]

(b) Using your answer from part (a), solve the equation
$x^2 + 3x - 10 = 0$

……

……

…… [2]

23.. For each of the following number series, find the next two terms and then find the nth term.

(a) **1, 4, 7, 10, …, …,**

Next two terms

…… [1]

nth term

…… [2]

(b) **3, 6, 11, 18, …, …,**

Next two terms

…… [1]

nth term

…… [2]

(c) **2, 4, 8, 16**, …, …,

Next two terms

…… [1]

nth term

…… [2]

24. Jason weighs 9 stone 8 pounds. He converts his weight to kilograms using the following calculation.

$$\frac{(9 \times 14) + 8}{2.2}$$

(a) What is his weight in Kg?

…… [1]

(b) Show how he could simplify the calculation to get a good mental estimate.

……

……

……

…… [2]

25. A survey was conducted in a street of 50 houses, asking how many people lived in each house. These are the results:

Size of household	1	2	3	4	5	6
Number of households	11	16	12	7	4	2

(a) Calculate the modal number of people per household.

……

……

…… [2]

(b) Calculate the median number of people per household.

……

……

…… [2]

(c) Calculate the mean number of people per household.

……

……

……

…… [3]

26. A wood with 600 trees is planted. The wood is planted with 200 pine trees, 80 oak trees, some birch trees and some ash trees.

(a) Five twelfths of the 600 trees are birch. How many birch trees are there?

……

……

…… [1]

(b) What is the ratio of pine trees to oak trees? Give your answer in its simplest form.

……

……

…… [2]

END OF EXAM

ANSWERS FOR PAST PAPER 6

1. $\frac{5}{7}$, $\frac{3}{4}$ $\frac{7}{9}$	17. (a) $\frac{9}{20}$ (b) $\frac{3}{4}$ (c) 1st ball - Bl $\frac{9}{20}$, Wh $\frac{1}{4}$, 2nd ball – R $\frac{5}{19}$, Bl $\frac{9}{19}$, Wh $\frac{5}{19}$, R $\frac{6}{19}$, Bl $\frac{8}{19}$, Wh $\frac{5}{19}$, R $\frac{6}{19}$, Bl $\frac{9}{19}$, Wh $\frac{4}{19}$ (d) $\frac{1}{19}$ (e) $\frac{17}{38}$
2. 8 hours	
3. (a) 108^o, (b) No 360^o is not a multiple of 108^o	
4. (a) a = 5, (b) f = -3, (c) h=7	18. (a) kite (b) trapezium (c) 45^o
5. (a) £118.80. (b) £15	19. 2p = 6r + 10
6. (a) 3848cm^2, (b) 11545cm^2, (c) B is the best with an area of 12723cm^2	20. (a) p>-3 (b) x>4
7. 10.5KG	21. 265^o
8. (a) on graph, (b) 10 cm2, (c)A'(-3,-8), B'(-1,-9), C'(-1,-4) , (d) $\frac{1}{2}$, (e) (2, -1)	22. (a) (x + 5)(x – 2) (b) x = -5 or x = 2
9. (a) 175, (b) 150	23. (a) 3, 16, 3n – 2 (b) 27,38, $n^2 + 2$ (c) 32, 64, 2^n
10. (a) -7, -8, -7, -4 (b) graph (c) x = -0.75 or x = 2.75	24. (a) 60.91 kg (b) $\frac{(10 \times 14) + 10}{2} = 75$
11.(a) 13.86cm, (b) 18cm	25.(a) 2 (b) 2 (c) 2.78
12. 63	26. (a) 250 (b) 5.2
13. 2a(a+4b) = 2a^2+8b 2(a^2+2b) = 2a^2+4b 12ab+9a = 3a(4b+3) 3a(4b+9a) = 12ab + 27a^2	
14. C and D	
15. a=-2 b=6	
16. (a) 8.1 x 10^5 (b) 9.3 x 10^{-3} (c) 0.0093	