Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Centre Number | | | | | |

Candidate Number | | | | |

Thursday 8 November 2018

Morning (Time: 1 hour 30 minutes) | Paper Reference **1MA1/2H**

Mathematics

Paper 2 (Calculator)
Higher Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P55588A

6/7/7/7/7/1/

P 5 5 5 8 8 A 0 1 2 0

Pearson

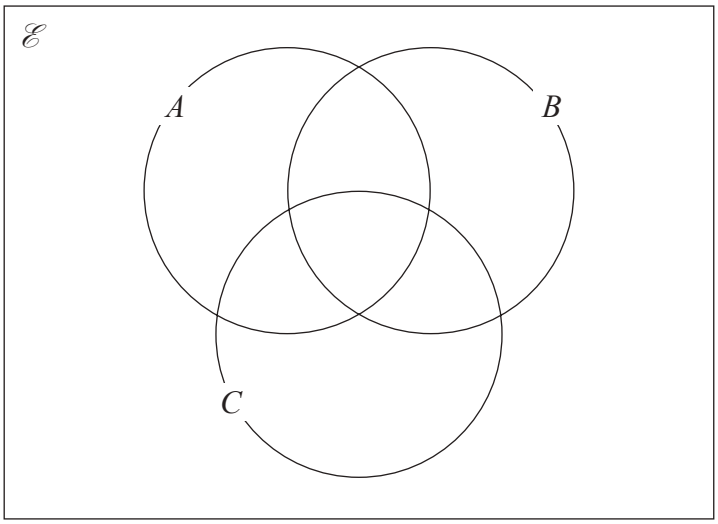
Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 $\mathscr{E}$ = {even numbers between 1 and 25}
A = {2, 8, 10, 14}
B = {6, 8, 20}
C = {8, 18, 20, 22}

(a) Complete the Venn diagram for this information.



(4)

A number is chosen at random from $\mathscr{E}$.

(b) Find the probability that the number is a member of $A \cap B$.

.....

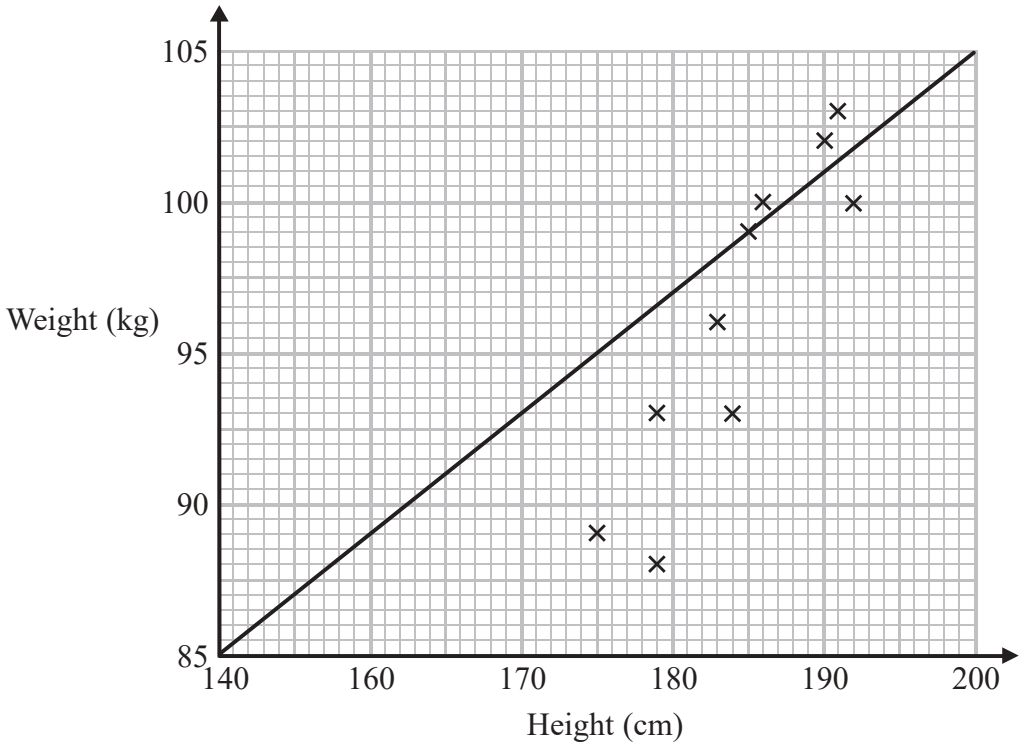
(2)

(Total for Question 1 is 6 marks)

2 Sean has information about the height, in cm, and the weight, in kg, of each of ten rugby players.

He is asked to draw a scatter graph and a line of best fit for this information.

Here is his answer.



Sean has plotted the points accurately.

Write down two things that are wrong with his answer.

1 .....

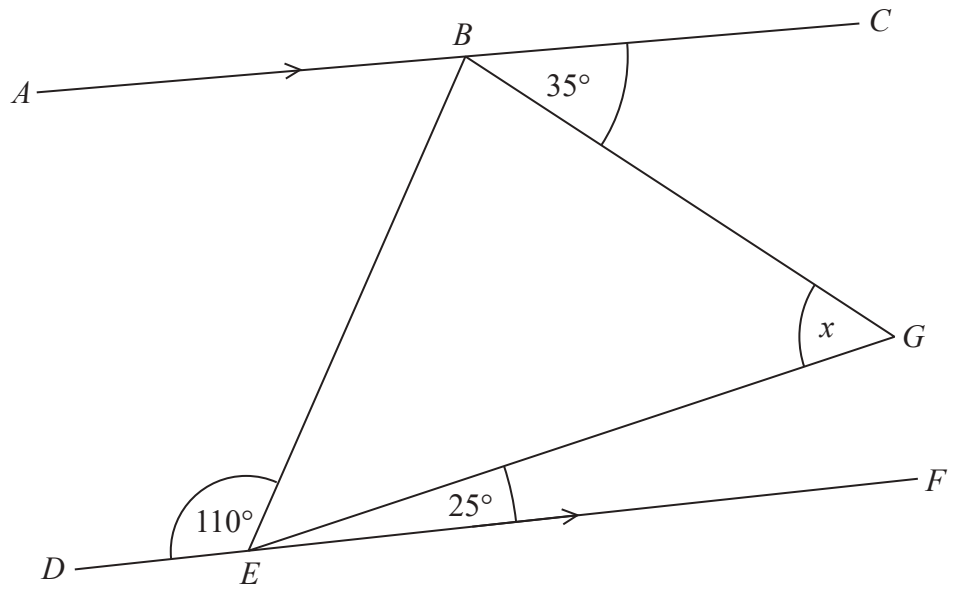
.....

2 .....

.....

(Total for Question 2 is 2 marks)

3 *BEG* is a triangle.



ABC and *DEF* are parallel lines.

Work out the size of angle *x*.
Give a reason for each stage of your working.

°

(Total for Question 3 is 4 marks)

4 Northern Bank has two types of account.
Both accounts pay compound interest.

Cash savings account
Interest
2.5% per annum

Shares account
Interest
3.5% per annum

Ali invests £2000 in the cash savings account.
Ben invests £1600 in the shares account.

(a) Work out who will get the most interest by the end of 3 years.
You must show all your working.

(4)

In the 3rd year the rate of interest for the shares account is changed to 4% per annum.

(b) Does this affect who will get the most interest by the end of 3 years?
Give a reason for your answer.

.....

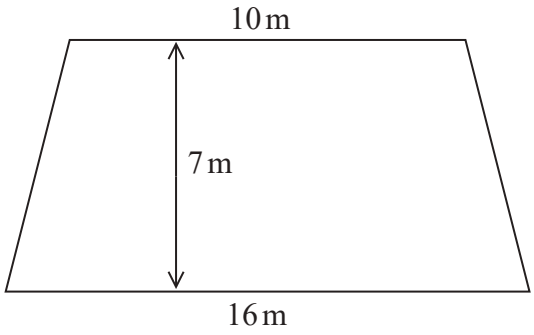
.....

.....

(1)

(Total for Question 4 is 5 marks)

5 The diagram shows a floor in the shape of a trapezium.



£16.99

John is going to paint the floor.

Each 5 litre tin of paint costs £16.99
1 litre of paint covers an area of 2 m^2

John has £160 to spend on paint.

Has John got enough money to buy all the paint he needs?
You must show how you get your answer.

(Total for Question 5 is 5 marks)

6 A is the point with coordinates (5, 9)
B is the point with coordinates (d, 15)

The gradient of the line AB is 3

Work out the value of d.

.....

(Total for Question 6 is 3 marks)

7 (a) Write the number 0.000 086 23 in standard form.

.....

(1)

(b) Work out $\dfrac{3.2 \times 10^{3} + 5.1 \times 10^{-2}}{4.3 \times 10^{-4}}$

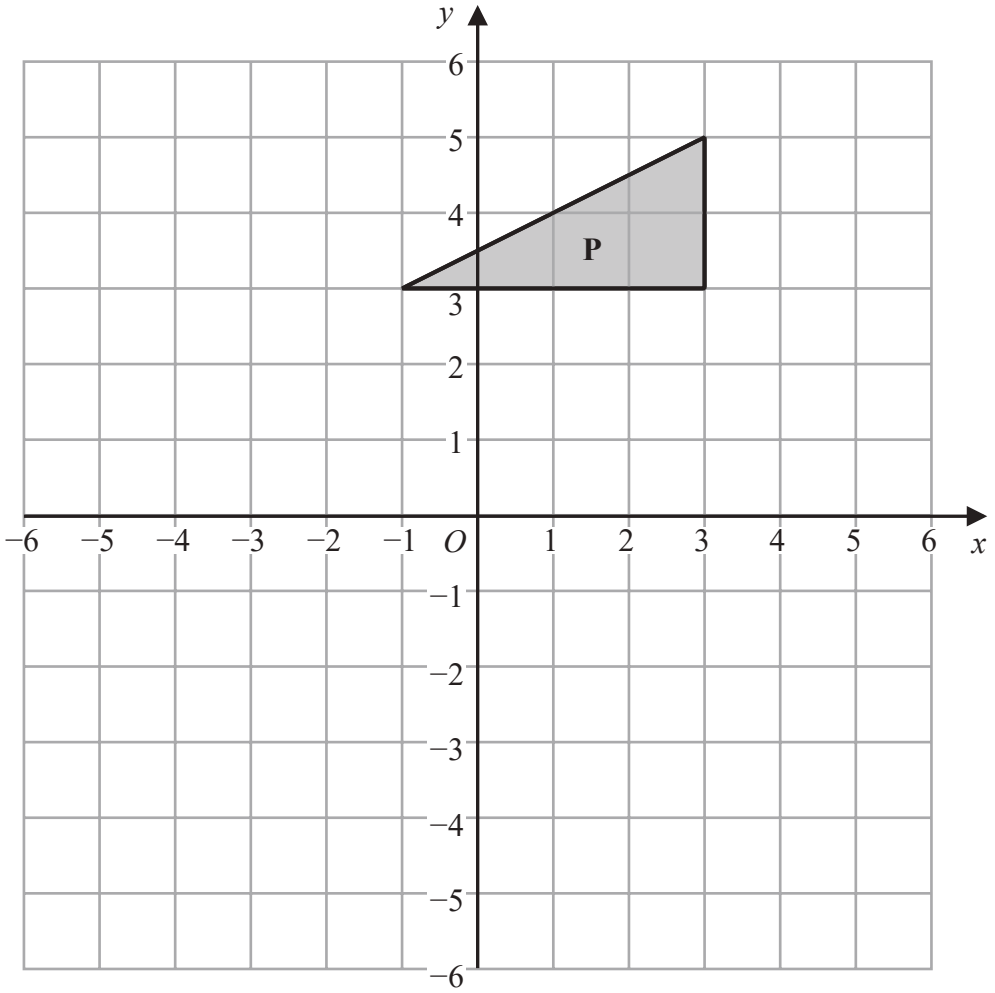
Give your answer in standard form, correct to 3 significant figures.

.....

(2)

(Total for Question 7 is 3 marks)

8



Triangle **P** is reflected in the line $y = -x$ to give triangle **Q**.
Triangle **Q** is reflected in the line $x = -1$ to give triangle **R**.

Describe fully the single transformation that maps triangle **R** to triangle **P**.

.....

(Total for Question 8 is 3 marks)

9 Martin truncates the number N to 1 digit.
The result is 7

Write down the error interval for N.

.....

(Total for Question 9 is 2 marks)

10 Robert makes 50 litres of green paint by mixing litres of yellow paint and litres of blue paint in the ratio 2 : 3

Yellow paint is sold in 5 litre tins.
Each tin of yellow paint costs £26

Blue paint is sold in 10 litre tins.
Each tin of blue paint costs £48

Robert sells all the green paint he makes in 10 litre tins.
He sells each tin of green paint for £66.96

Work out Robert's percentage profit on each tin of green paint he sells.

.....%

(Total for Question 10 is 5 marks)

11 In a restaurant there are

9 starter dishes
15 main dishes
8 dessert dishes

Janet is going to choose one of the following combinations for her meal.

a starter dish and a main dish
or a main dish and a dessert dish
or a starter dish, a main dish and a dessert dish

Show that there are 1335 different ways to choose the meal.

(Total for Question 11 is 3 marks)

12 (a) Write $\dfrac{4x^2 - 9}{6x + 9} \times \dfrac{2x}{x^2 - 3x}$ in the form $\dfrac{ax + b}{cx + d}$ where a, b, c and d are integers.

.....

(3)

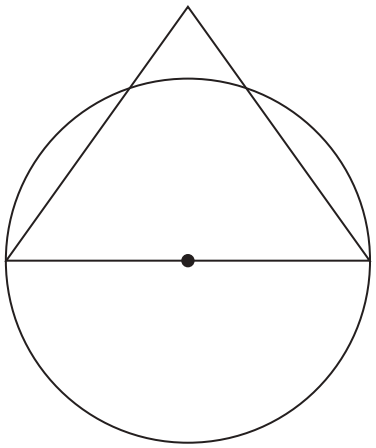
(b) Express $\dfrac{3}{x+1} + \dfrac{1}{x-2} - \dfrac{4}{x}$ as a single fraction in its simplest form.

.....

(3)

(Total for Question 12 is 6 marks)

13 The diagram shows a circle and an equilateral triangle.



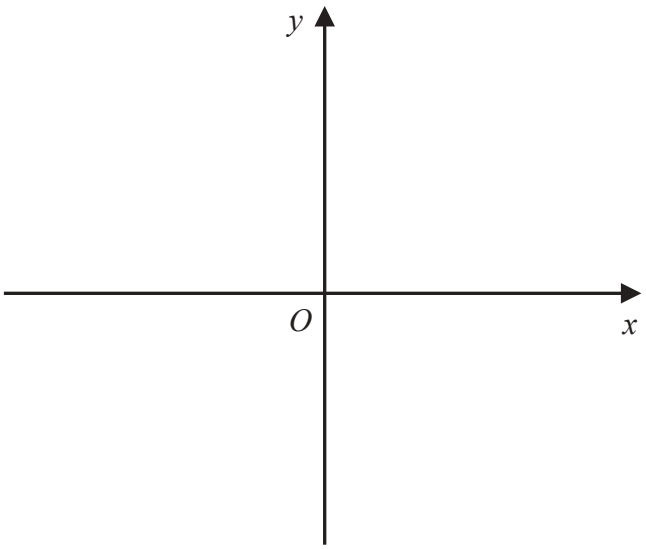
One side of the equilateral triangle is a diameter of the circle.
The circle has a circumference of 44 cm.

Work out the area of the triangle.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 13 is 3 marks)

14 On the grid, sketch the curve with equation $y = 2^x$
Give the coordinates of any points of intersection with the axes.



(Total for Question 14 is 2 marks)

15 The equation of a circle is $x^2 + y^2 = 42.25$

Find the radius of the circle.

.....

(Total for Question 15 is 1 mark)

16 There are only red counters and blue counters in a bag.

Joe takes at random a counter from the bag.
The probability that the counter is red is 0.65
Joe puts the counter back into the bag.

Mary takes at random a counter from the bag.
She puts the counter back into the bag.

(a) What is the probability that Joe and Mary take counters of different colours?

.....

(2)

There are 78 red counters in the bag.

(b) How many blue counters are there in the bag?

.....

(2)

(Total for Question 16 is 4 marks)

17 p and q are two numbers such that $p > q$

When you subtract 5 from p and subtract 5 from q the answers are in the ratio 5 : 1
When you add 20 to p and add 20 to q the answers are in the ratio 5 : 2

Find the ratio $p : q$
Give your answer in its simplest form.

.....

(Total for Question 17 is 5 marks)

18 The straight line $\mathbf{L}_1$ passes through the points with coordinates (4, 6) and (12, 2)
The straight line $\mathbf{L}_2$ passes through the origin and has gradient -3

The lines $\mathbf{L}_1$ and $\mathbf{L}_2$ intersect at point P.

Find the coordinates of P.

(..... , ...)

(Total for Question 18 is 4 marks)

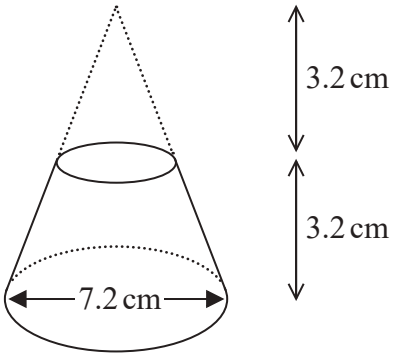
19 Solve $22 < \frac{m^2 + 7}{4} < 32$

Show all your working.

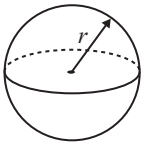
.....

(Total for Question 19 is 5 marks)

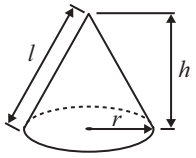
20 Here is a frustum of a cone.



Volume of sphere = $\frac{4}{3}\pi r^3$



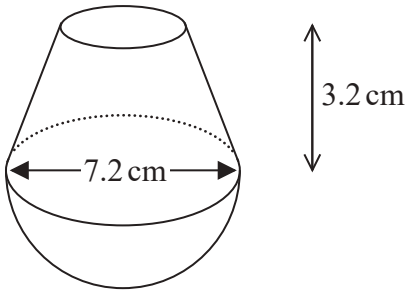
Volume of cone = $\frac{1}{3}\pi r^2 h$



The diagram shows that the frustum is made by removing a cone with height 3.2 cm from a solid cone with height 6.4 cm and base diameter 7.2 cm.

The frustum is joined to a solid hemisphere of diameter 7.2 cm to form the solid **S** shown below.

Solid **S**



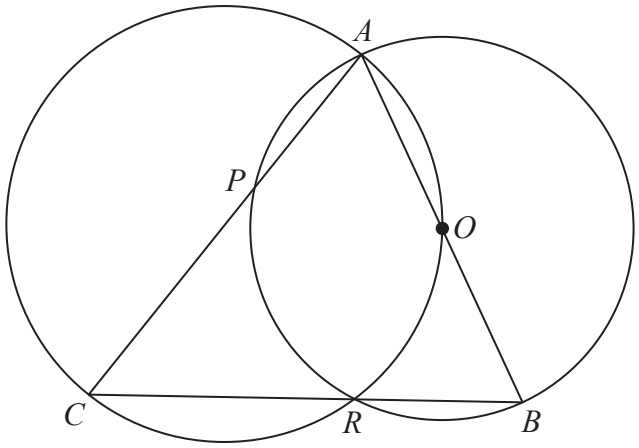
The density of the frustum is 2.4 g/cm^3
The density of the hemisphere is 4.8 g/cm^3

Calculate the average density of solid **S**.

.....g/cm^3

(Total for Question 20 is 5 marks)

21



A, *B*, *R* and *P* are four points on a circle with centre *O*.
A, *O*, *R* and *C* are four points on a different circle.
The two circles intersect at the points *A* and *R*.

CPA, *CRB* and *AOB* are straight lines.

Prove that angle *CAB* = angle *ABC*.

(Total for Question 21 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS

Mark Scheme (Results)

November 2018

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Higher (Calculator) Paper 2H

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

November 2018
Publications Code 1MA1_2H_1810_MS

General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

1 All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

2 All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

Questions where working is not required: In general, the correct answer should be given full marks.
Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

3 Crossed out work

This should be marked **unless** the candidate has replaced it with an alternative response.

4 Choice of method

If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

5 Incorrect method

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.

6 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

7 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (eg. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

8 Probability

Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9 Linear equations

Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

10 Range of answers

Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and all numbers within the range.

11 Number in brackets after a calculation

Where there is a number in brackets after a calculation E.g. 2 × 6 (=12) then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

12 Use of inverted commas

Some numbers in the mark scheme will appear inside inverted commas E.g. “12” × 50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

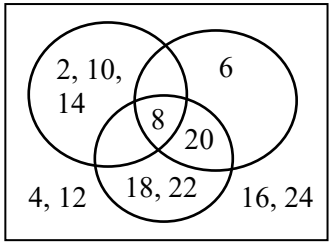
13 Word in square brackets

Where a word is used in square brackets E.g. [area] × 1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

14 Misread

If a candidate misreads a number from the question. Eg. uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

Guidance on the use of abbreviations within this mark scheme	
M	method mark awarded for a correct method or partial method
P	process mark awarded for a correct process as part of a problem solving question
A	accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)
C	communication mark awarded for a fully correct statement(s) with no contradiction or ambiguity
B	unconditional accuracy mark (no method needed)
oe	or equivalent
cao	correct answer only
ft	follow through (when appropriate as per mark scheme)
sc	special case
dep	dependent (on a previous mark)
indep	independent
awrt	answer which rounds to
isw	ignore subsequent working

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
1 (a)	Venn diagram	C4	fully correct Venn diagram	
		(C3	7 of the 8 regions correct **or** for a diagram with only one number incorrectly placed)	
		(C2	5 or 6 of the 8 regions correct)	
		(C1	3 or 4 of the 8 regions correct)	
(b)	$\frac{1}{12}$	M1	ft for identification of 1 or 12 eg from the diagram	Need not be written as a fraction or probability at this stage. eg could be a ratio 1:12
		A1	ft oe	Acceptable equivalents are (eg, could ft) any fraction equivalent to $\frac{1}{12}$, 0.08(33..) or 8(.33..)%

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
2	statements	C1	for lobf incorrect **Acceptable examples** lobf lobf does not suit all points/not a lobf lobf wrong since hits *x* axis/is inaccurate/should be amongst the crosses lobf goes through the origin/through one point **Not acceptable examples** no correlation/there is no title	
		C1	for height scale not linear **Acceptable examples** 150 missing Height not linear / Height numbers going up wrong **Not acceptable examples** 150 graph does not start at 140/graph does not start at 0 height should start at 170	

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
3	60	M1	use of parallel lines to find an angle eg *ABE*=70 **or** *EBG*=75 **or** *EBC* = 110 **or** shows parts of *x* as 35 or 25	Parts of *x* should be identified on the diagram by the insertion of a dividing line through angle *x* (need not be identified or drawn parallel).
		M1	for a complete method to find angle *x*; could be in working or on the diagram	Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		A1	for *x* = 60	
		C1	(dep on M1) for one reason linked to parallel lines and one other reason, supported by working taken from: alternate angles are equal, allied angles / co-interior angles add up to 180, angles on a straight line add up to 180, angles in a triangle add up to 180°	Underlined words need to be shown; reasons need to be linked to their method; any reasons not linked do not credit. There should be no incorrect reasons given.
4 (a)	Ben (supported)	P1	shows how to work interest out for one year eg 2000 × 0.025 (= 50) **or** 1600 × 0.035 (= 56) **or** 150 **or** 168 **or** 2000×1.025 (= 2050**) or** 1600 × 1.035 (= 1656)	Throughout accept figures ±1 pence which do not need to be presented in money notation (to 2dp) or with monetary symbols.
		P1	shows compound interest calculation for one account eg 2050→51.25 **or** 2101.25→52.53 **or** 1656→57.96 **or** 1713.96→59.99 eg 2000×1.025^3 (= 2153.78**) or** 1600 × 1.035^3 (= 1773.95)	Award mark for a correct process shown, for which these figures can be taken as implying the process.
		P1	shows complete compound interest calculation for both accounts eg 2000×1.025^3 (= 2153.78**) and** 1600 × 1.035^3 (= 1773.95) OR one interest stated correctly eg 153.78 **or** 173.95	As above, award mark for both correct processes shown for both accounts, which these figures can be taken as implying the process.
		C1	Ben (shares) supported by 153.78 **and** 173.95	Accept an answer of "shares".

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
4 (b)	conclusion	C1	conclusion (ft) eg no change, shares now 182.5… **Acceptable examples** no since shares/Ben now 182.5 Still Ben since 182.5 > Ali No; he only gets 8.57 more No; he gets 68.56 instead of 59.98 (3rd yr) No; Ben already gets more interest, he would just get even more **Not acceptable examples** no shares now 182.5 Still Ben since less than Ali 182.5 > 153.78 no; he needs 20.17 more .	Conclusion needs to be supported. ft is from part (a); calculations carried out as part of (b) need to be correct for the comparison to be valid.
5	No (supported)	P1	calculates area of trapezium eg ½ × 7 × (10+16) (= 91)	
		P1	for division by coverage eg ÷2 or [area of trapezium] ÷ 2 (= 45.5) or process to find coverage per tin eg 5 × 2 (= 10)	for process to find number of tins bought eg 160 ÷ 16.99 = 9 tins [area of trapezium] needs to be clearly stated if the process of finding the area is not clear
		P1	for division to find the number of tins eg ÷5 or "45.5" ÷ 5 (= 9.1) **or** [area of trapezium] ÷ "10" (= 9.1)	for using whole no. of tins to find total litres eg 9 × 5 (= 45)
		P1	(dep on at least P2) for a process to multiply a whole number of tins (rounded up) by 16.99	(dep on at least P2) for a process to find the total coverage eg "45" × 2 (= 90)
		C1	for 'No' supported by correct figures eg 169.9 or 90 **and** 91	There must be a conclusion ("No" or equivalent wording) including the figure 169.9 and working showing processes followed.

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
6	7	P1 P1 A1	process to use gradient eg $y = 3x + c$ **or** $c = -6$ **or** $\frac{15-9}{d-5}$ **or** $(15 - 9) \div 3$ **or** (6, 12) (dep) full process to rearrange equation formed to isolate d eg rearrangement of $15 = 3d - 6$ or $3 = \frac{15-9}{d-5}$ **or** for $5 + \frac{15-9}{3}$ cao	Condone use of a letter other than d, for d Must show processes to get as far as $d =$ Award P2 for an answer of (7, 15)
7 (a)	8.623×10^{-5}	B1	cao	
(b)	7.44×10^6	M1 A1	for $\frac{3200 + 0.051}{0.00043}$ or $\frac{3200.051}{0.00043}$ **or** performs an operation eg shows 163.2, 7441860.5, 118.6(…) **or** an answer or $7.44(\ldots.) \times 10^n$ where $n \neq 6$ or 7441979(….) **or** an answer of 7.4×10^6 for $7.44(1979\ldots) \times 10^6$	7441979.0689… If a correct answer is shown in working and then rounded incorrectly, award full marks. Answer need only be given correctly to 3 sig fig; if following digits are incorrect ignore them.
8	Rotation 90º anticlockwise centre $(-1,1)$	M1 A1 A1	stating rotation **or** for showing **R** [(1,1), (1,−3), (3,−3)] for rotation of 90º anticlockwise for centre $(-1, 1)$ given as a coordinate.	Award for a triangle in the correct position without the label R as long as this is the only triangle in lower right quadrant. Accept rotation of 270° clockwise Can be given as a coordinate alone. Do not award A marks if there is evidence of other transformations in the description, or other ambiguity in the answer given.

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9	$7 \leq N < 8$	M1	for identifying the key numbers 7 and 8	Ignore any inequality symbols used at this stage Accept 7.9 (recurring) for 8 as shown by 7.999 or 7.9… or recurring notation (or words)
		A1	cao	
10	35	P1	use of ratio 2:3 and tin quantities to find overall ratio of litres eg 4:3 or 4 tins : 3 tins **or** 20 litres (Y) & 30 litres (B)	
		P1	calculates total cost of making paint eg 4 × 26 + 3 × 48 (50 litres) **or** 104+144 (=248)	Could be multiples 4 & 3 (for an amount which is a multiple of 50 litres). "248" is the total cost for making 50 litres
		A1	calculates comparable cost eg 10 litres (1 tin) green paint made as 49.6 **or** differences (profit) for 1 tin as 17.36 or 5 tins as 86.8 **or** total comparable costs for 50 litres as 334.8 **and** 248, for 25 litres as 167.4 **and** 124 or 1 litres as 33.48 **and** 24.8	"248" ÷ 5 = 49.6 for 10 litre (1 tin) green paint made Profit on 10 litres is 66.96 − 49.60 = 17.36 Profit on 50 litres is 304.8 − 248 = 86.8 334.8 comes from 5 × 66.96 and is the selling price for 50 litres green paint
		P1	for percentage calculation eg $\frac{1736}{4960}\times 100$, $\frac{"334.8"-"248"}{"248"}\times 100$	
		A1	cao	

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
11	1335	M1	for one correct procedure eg 9×15 (=135) **or** 15×8 (=120) **or** $9 \times 15 \times 8$ (=1080)	Ignore additional products.
		M1	for all three correct products eg "135", "120", "1080" **or** 9×15, 15×8, $9 \times 15 \times 8$ oe	Only these three products must be identified. There is no need to indicate summing at this stage.
		C1	for showing the three correct products added eg 135 + 120 + 1080	There is no need to show the three products sum to 1335
12 (a)	$\frac{4x-6}{3x-9}$	M1	factorises numerator of $4x^2 - 9$ eg $(2x - 3)(2x + 3)$ oe	$\frac{2x(2x-3)(2x+3)}{3x(2x+3)(x-3)}$
		M1	factorises denominator eg $x(x-3)$ or $3(2x + 3)$ or for $3x(2x^2 - 3x - 9)$	
		A1	cancels to give $\frac{4x-6}{3x-9}$	Accept $a = 4$, $b = -6$, $c = 3$, $d = -9$
(b)	$\frac{-x+8}{x(x+1)(x-2)}$	M1	method to use a common denominator eg $x(x+1)(x-2)$ by multiplying terms	Method must involve finding equivalents for all three separate terms; may be done in several stages.
		M1	deduce numerator eg $3x(x-2) + x(x+1) - 4(x+1)(x-2)$	
		A1	oe	Equivalents must be algebraically equivalent and must have involved full simplification.

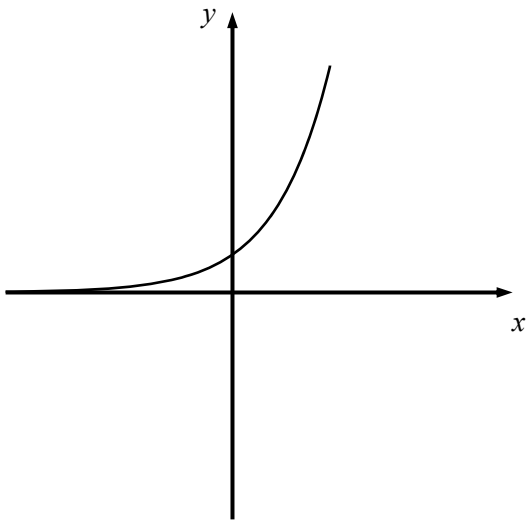
Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
13	84.9	P1	shows a process to find the radius or diameter eg $44 = 2 \times \pi \times r$ **or** $r = \frac{22}{\pi}$ **or** $d = \frac{44}{\pi}$ **or** $r = 7.0028$ **or** $d = 14.0056..$	Allow r in the range 7 to 7.1 and d in the range 14 to 14.1 Could be shown on the diagram.
		P1	(dep on P1) complete method to find the area eg ½ × "d" ^{2} × Sin60 oe, ½ × 14 × Tan60 oe, ½ × 14 × $\sqrt{14^2 - 7^2}$ oe	
		A1	for answer in the range 84.8 to 85	If the correct answer in the range is given in working and then rounded incorrectly award full marks.
14	curve	C1	sketch of graph which starts above x-axis for negative x, and makes an increasing exponential rise into positive x	Condone graph "touching" the x axis. Do not award from a graph for positive x only.
	(0,1) labelled	C1	for showing a label of (0,1) on the y axis	Do not award if a point is given for crossing the x-axis. Accept the coordinates shown as a label of "1" written on the y axis at the intersection.
15	6.5	B1	oe	Accept (eg) $6\frac{1}{2}$ and $\sqrt{42.25}$

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
16 (a)	0.455	M1	for $0.65 \times (1 - 0.65)$ or 0.65×0.35 $(=0.2275$ or $\frac{91}{400})$ or 2×0.2275 oe	Could be shown on a tree diagram but must show an intention to multiply
		A1	oe	Acceptable equivalents are 45.5% or $\frac{91}{200}$ oe
(b)	42	M1	for a start of the process eg $78 \div 0.65$ $(= 120)$ or 78×0.35 $(=27.3)$	$\frac{78 \times 0.35}{0.65}$, $\frac{78}{0.65} - 78$
		A1	cao	
17	4 : 1	P1	for associating algebraic expressions with the correct ratio eg $p - 5 : q - 5$ $(= 5 : 1)$ or $p + 20 : q + 20$ $(= 5 : 2)$	
		P1	for $\frac{p+20}{q+20} = \frac{5}{2}$ **or** $\frac{p-5}{q-5} = \frac{5}{1}$ oe **or** $p - 5 = 5(q - 5)$ **or** $2(p + 20) = 5(q + 20)$ oe	Award for one of the two simultaneous equations eg $5q - p = 20$, $5q - 2p = -60$ oe
		M1	for a complete method shown to find p **or** q	Award for a simultaneous equation method to eliminate one variable leading to either $p = 80$ or $q = 20$
		M1	for a complete method shown to find p **and** q **or** two values for p and q that are in the ratio 4 : 1 or an unsimplified ratio 4 : 1 (eg 80 : 20) or an answer of 1 : 4	Award for a simultaneous equation method to eliminate both variables leading to either $p = 80$ **and** $q = 20$
		A1	cao	

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
18	$\left(\frac{-16}{5}, \frac{48}{5}\right)$	P1 P1 P1 A1	for a method to find gradient of $\mathbf{L}_1$ eg $\frac{6-2}{4-12}$ (= − ½) or states $\mathbf{L}_2$ as $y = -3x$ (dep on P1) for a method to find equation of $\mathbf{L}_1$ eg subs into y= "− ½"x+c OR states $\mathbf{L}_1$ as y = "− ½"x + 8 (dep on P2) complete method to equate both lines eg "− ½"x + 8 = −3x oe	Ignore sketches. Accept equivalents eg (−3.2, 9.6)
19	$9 < m < 11$ $-11 < m < -9$	M1 M1 M1 M1 A1	for a correct method to begin rearranging to solve for m^2 eg $88 < m^2 + 7$ or $m^2 + 7 < 128$ or $81 < m^2 < 121$ for a complete method to $m^2 = 81$ or $m^2 = 121$ or better for a set of critical values: at least two out of 9, 11, −9, −11 for selecting a correct inequality for one set of critical values eg $9 < m$ and $m < -9$ **or** $m < 11$ and $-11 < m$ **or** $9 < m$ and $m < 11$ or a set of inequalities with some error eg 9 ? m ? 11 and −11 ? m ? −9 where ? is an incorrect inequality symbol like $9 < m \leq 11$ or $9 \geq m \geq 11$ or answer given as $\pm 9 < m < \pm 11$ $9 < m < 11$ and $-11 < m < -9$ given as boundaries of m	It is insufficient to just multiply all three elements by 4; some rearrangement must occur such as showing as two separate inequalities or isolating m^2 Accept an inequality used in place of "=". m^2 must be isolated at this stage. Do not award if other values are also given eg 10 Could be shown as $9 < m < 11$ or $-11 < m < -9$ or $-11 < m < 11$ Accept with an "and" or an "or" or neither

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
20	3.75	P1	works to find vol of frustum eg $1/3\pi(3.6)^2\times6.4 - 1/3\pi(1.8)^2\times3.2$ or 86.858.. − 10.857… (=24.192π or 76.00..)	
		P1	works to find vol of hemisphere eg $\frac{1}{2}\times\frac{4}{3}\pi\times3.6^3$ (=31.104π or 97.7....)	781.7… by use of diameter does not get the mark
		P1	mass of frustum as [vol]×density eg "76.00" × 2.4 (=182.4..) **or** mass of hemisphere as [vol]×density eg "97.7...."×4.8 (=469.037...)	[vol] is their volume which could be ft using the radius, using the diameter, or could be another value as long as it is stated as being the volume, or clearly intended from working.
		P1	mean density as total mass ÷ total volume eg ("182.4.." + "469.037") ÷ ("76…" + "97.7..") or "651.4..". ÷ "173.7...."	All figures must come from correct method shown.
		A1	answer in the range 3.7 to 3.8	
21	proof	C1	uses cyclic quad eg if $CAB = x$ then $CRO = 180 - x$ (Opposite angles of a cyclic quadrilateral add up to 180°.)	Underlined words need to be shown; reasons need to be linked to their method; any reasons not linked do not credit.
		C1	establishes relationship outside a circle eg $ORB = x$ (Angles on a straight line add up to 180)	Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		C1	uses properties of a circle eg $RO = OB$ (both radii) so $ABC = x$ (Base angles of an isosceles triangle are equal.)	
		C1	Complete proof and conclusion	Full reasons given without any redundant reasons and correct reasoning throughout.

Question 14: sketch of $y = 2^x$



Modifications to the mark scheme for Modified Large Print (MLP) papers. Paper 2H.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:

Angles: ±5º

Measurements of length: ±5 mm

PAPER: 1MA1_2H			
Question		**Modification**	**Mark scheme notes**
1		Diagram enlarged. Wording added 'It shows a Venn diagram.' Circles labelled 'set A', 'set B' and 'set C'. Braille only – sticky labels provided.	Standard mark scheme
2		Diagram enlarged. Crosses changed to solid dots. Axes labels moved to the left of the horizontal axis and above the vertical axis. Wording changed from 'Here is his answer.' to 'His answer is shown in the Diagram Book.'	Standard mark scheme
3		Diagram enlarged. Arrows moved further to the right and made bigger. Angles moved outside of the angle arcs and angle arcs made smaller. Wording added 'Angle CBG = 35°, Angle BED = 110°, Angle GEF = 25°, Angle BGE is marked x.' Wording changed from 'Work out the size of angle x.' to 'Work out the size of the angle marked x.	Standard mark scheme

PAPER: 1MA1_2H			
Question		**Modification**	**Mark scheme notes**
5		Diagram enlarged and a model provided for all candidates. Wording added 'The diagrams show a floor in the shape of a trapezium and a tin of paint. The model represents the tin of paint.' Braille only – parallelogram labelled ABCD, added information about the shape.	Standard mark scheme
8		Diagram enlarged. Shading changed to dotty shading. Wording added 'It shows triangle P, triangle Q and triangle R on a grid.' Triangle P moved to (1,3), (5,3), (5,5). Triangle Q added at (-3,-1), (-3,-5), (-5,-5) and Triangle R added at (1,-1), (1,-5), (3,-5). Labels put above the shapes. Shape provided for all candidates. Wording added 'A cut out shape is available if you wish to use it.' Question wording changed: 8(a) Describe the single transformation that maps triangle P onto triangle Q.' (1 mark) 8(b) Describe the single transformation that maps triangle Q onto triangle R.' (1 mark) 8(c) Describe fully the single transformation that maps triangle R onto triangle P.' (1 mark)	(a) C1 for "reflection in the line $y = -x$ (b) C1 for "reflection in the line $x = -1$" (c) C1 for "rotation of 90° anticlockwise about the point $(-1,1)$" OR rotation of 270° clockwise about the point $(-1,1)$
12		In both parts x changed to y.	Standard mark scheme but x changed to y.
13		Diagram enlarged	Standard mark scheme
14		Diagram enlarged	Standard mark scheme

PAPER: 1MA1_2H			
Question		**Modification**	**Mark scheme notes**
20		Diagrams enlarged, simplified and made 2D. 2 models provided, Model 1 and Model 2. Wording changed to 'There are two models, Model 1 and Model 2.' Diagrams labelled Diagram 1 and Diagram Wording changed from 'Here is a frustum of a cone' to 'Diagram 1 and Model 1 show a frustum of a cone'. Wording changed from 'The frustum is'. to 'Diagram 2 and Model 2 show the frustum'. Wording 'shown below' removed	Standard mark scheme
21		Diagram enlarged	Standard mark scheme

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom