Write your name here

Surname	Other names

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

Centre Number

Candidate Number

Mathematics

Paper 2 (Calculator)

Mr Musson & Mr Coren's predicted Paper 2
NOTE: THIS IS A BEST GUESS OF TOPICS THAT HAVE NOT YET APPEARED IN PAPER 1.

Foundation Tier

Time: 1 hour 30 minutes

Paper Reference
1MA1/2F

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 section is **180**
- 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 time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

Q1.

Here is a list of numbers.

1 2 5 6 12

From the list, write down

(i) a multiple of 4

....

(ii) a prime number

....

(Total for question is 2 marks)

Q2.

Find the highest common factor (HCF) of 32, 48 and 72

....

(Total for question = 2 marks)

Q3.

Here is a list of numbers.

11 12 13 14 15 16 17 18 19 20

From the list, write down

(a) a factor of 24

.... **(1)**

(b) a multiple of 7

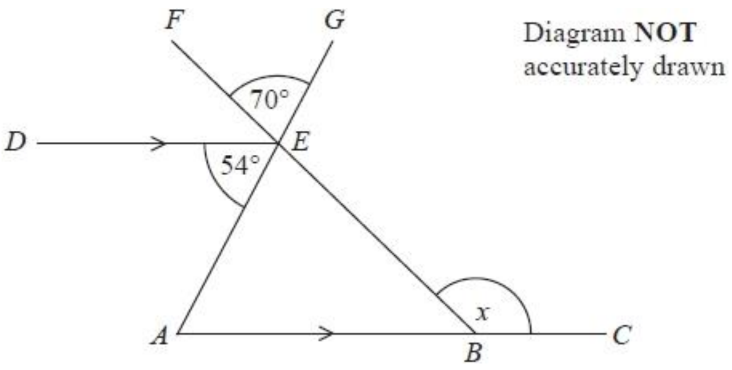
.... **(1)**

(c) a square number

.... **(1)**

(Total for Question is 3 marks)

Q4.



ABC and *DE* are parallel lines.
AEG and *BEF* are straight lines.

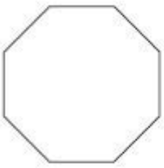
Angle *AED* = 54°
Angle *FEG* = 70°

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

(Total for question = 4 marks)

Q5.

Here is a polygon.



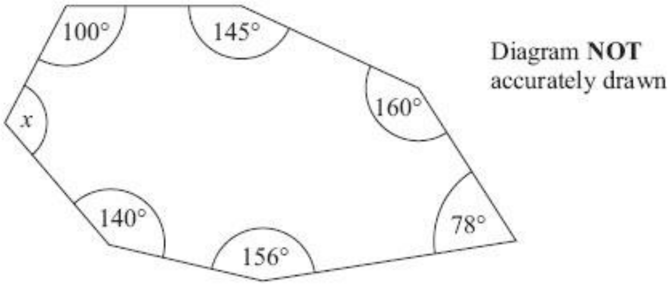
(a) Write down the mathematical name of this polygon.

.... **(1)**

(b) In the space below, draw a pentagon.

(1)

Here is a heptagon.



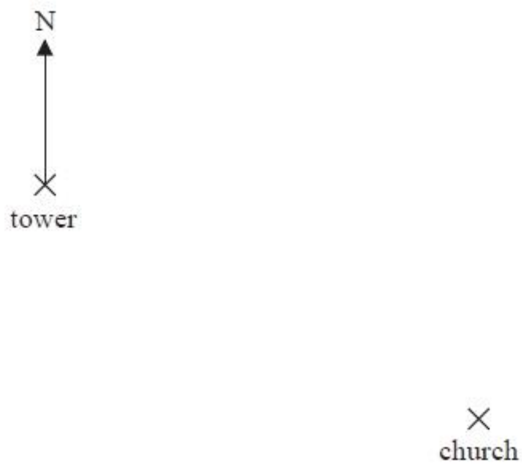
All the angles of a heptagon add up to 900°

(c) Work out the size of the angle marked *x*.

.... **(3)**

(Total for Question is 5 marks)

Q6. The diagram shows part of a map.



(a) Find the bearing of the church from the tower.

..........................° **(1)**

The scale of the map is 1 cm represents 2.5 km.

(b) Work out the real distance between the tower and the church.

..........................km **(2)**

A school is 15 km due North of the church.

(c) On the diagram, mark with a cross (×) the position of the school. Label your cross S.

(2)

(Total for Question is 5 marks)

Q7.

ABDE is a rectangle.
ED is 8cm.

BDC is a right-angled triangle.
BC is 4.5cm.

ABC is a straight line.

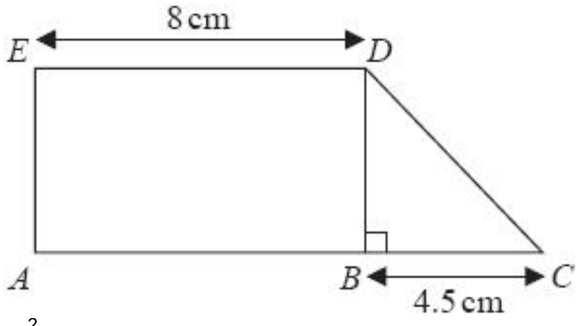


Diagram **NOT** accurately drawn

The area of the rectangle *ABDE* is 40cm^2.
Work out the area of the triangle *BDC*.

....cm^2

(Total for question = 3 marks)

Q8.

(a) Write 3500 m*l* in litres.

.... litres **(1)**

(b) Write 3 kilograms in grams

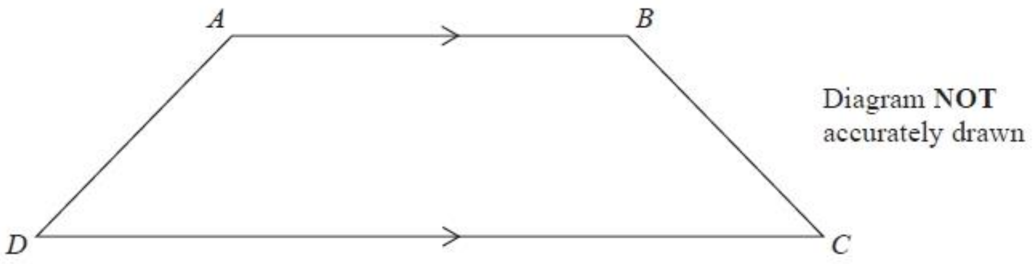
.... grams **(1)**

(c) Change 3 m^2 to cm^2.

.... cm^2 **(2)**

(Total for question = 4 marks)

Q9. The diagram shows a trapezium.



AD = *x* cm.
BC is the same length as *AD*.
AB is twice the length of *AD*.
DC is 4 cm longer than *AB*.

The perimeter of the trapezium is 38 cm.

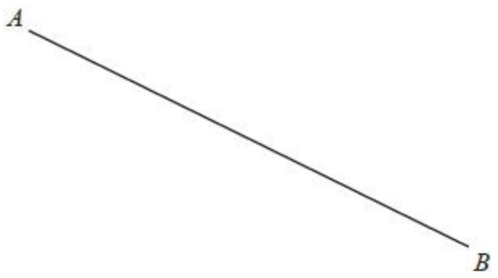
Work out the length of *AD*.

.... cm

(Total for Question is 4 marks)

Q10.

In the space below, use ruler and compasses to construct the perpendicular bisector of line *AB*.



(Total for question = 2 marks)

Q11.

(a) Draw an angle of 40° at the point *P*.

(1)

(b) Construct an equilateral triangle with sides of length 6cm.

(2)

(Total for question = 3 marks)

Q12. David drives to the supermarket on his way home from work.

The table shows some information about his journey.

	Time
Leaves work	1730
Gets to supermarket	1745
Leaves supermarket	1810

(a) How many minutes is David at the supermarket?

.... minutes (1)

David leaves the supermarket at 1810. He drives 20 miles to his home.
The speed limit for the journey is 30 mph. David drives within the speed limit.

(b) Can David get home before 1900? Give reasons for your answer.

(3)

(Total for question = 4 marks)

Q13. A gold bar has a mass of 12.5 kg.

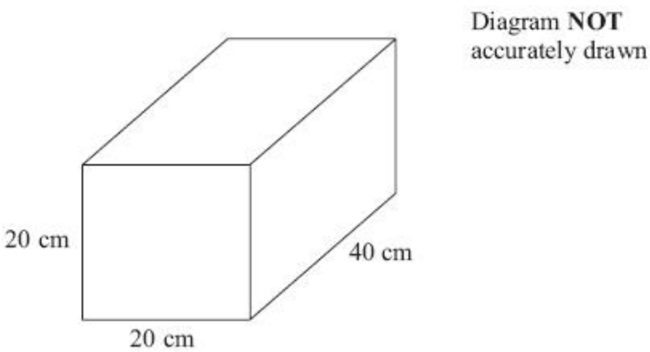
The density of gold is 19.3 g/cm^3

Work out the volume of the gold bar.
Give your answer correct to 3 significant figures.

.... cm^3

(Total for question = 3 marks)

Q14. Here is a cuboid.



Work out the volume of the cuboid.

....

(Total for Question is 3 marks)

Q15. The diagram shows a container used to store oil.

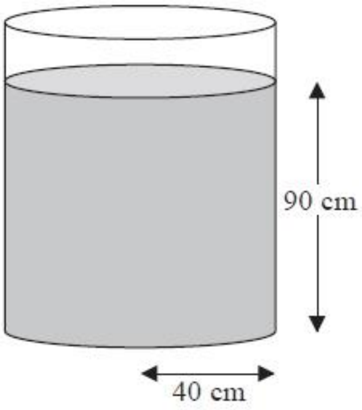


Diagram **NOT** accurately drawn

The container is in the shape of a cylinder of radius 40 cm.

The height of the oil in the container is 90 cm.

65 litres of oil are taken from the container.
1 litre = 1000 cm^3.

Work out the new height of the oil in the container.
Give your answer correct to one decimal place.

..........................cm

(Total for Question is 4 marks)

Q16.
A circle has a diameter of 140 cm.

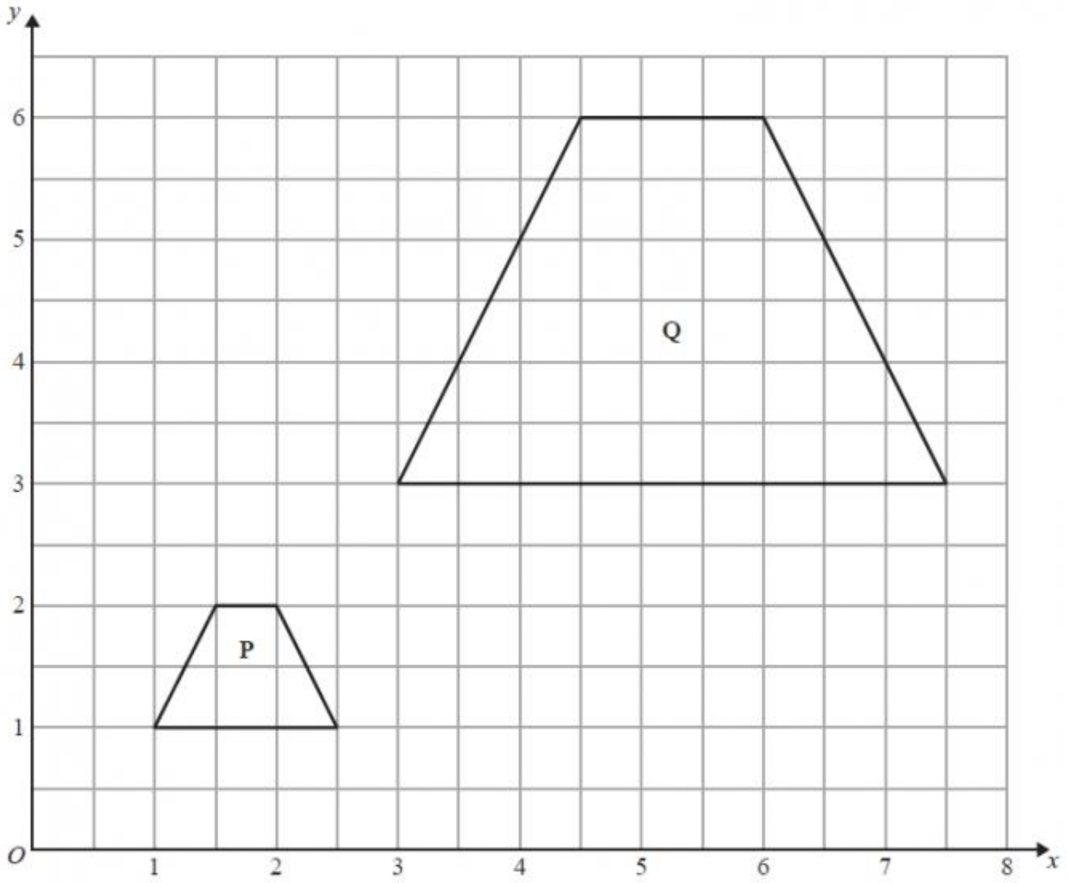
Work out the circumference of the circle.

Give your answer correct to 3 significant figures.

.... cm

(Total for Question is 2 marks)

Q17.



Describe fully the single transformation that maps shape **P** onto shape **Q**.

....

....

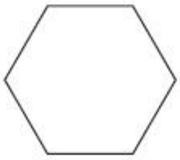
(Total for Question is 3 marks)

Q18. Here is a shape.

(a) Draw all the lines of symmetry on this shape.

(2)

Here is a regular hexagon.



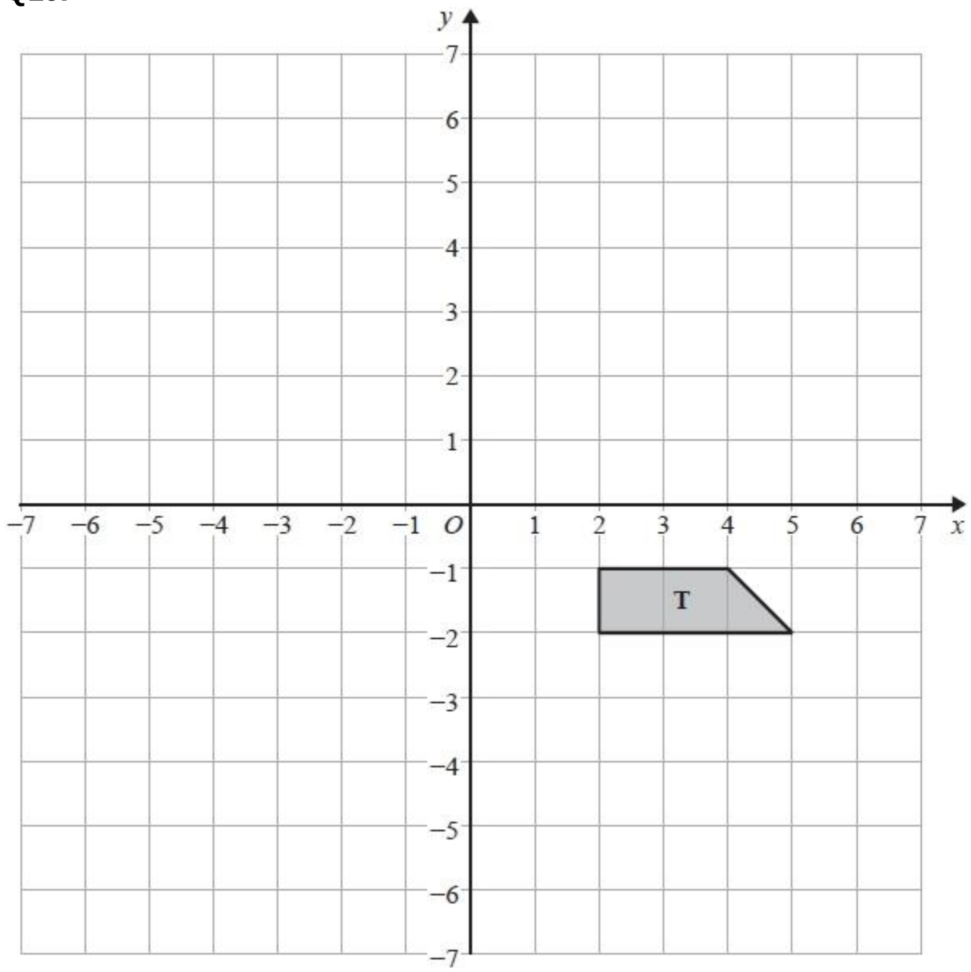
(b) Write down the order of rotational symmetry of this regular hexagon.

....

(1)

(Total for Question is 3 marks)

Q19.



(a) Rotate trapezium **T** 180° about the origin. Label the new trapezium **A**.

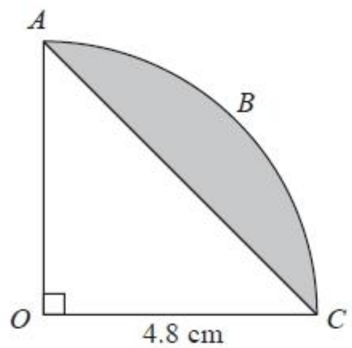
(1)

(b) Translate trapezium **T** by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$ Label the new trapezium **B**.

(1)

(Total for question = 2 marks)

Q20.



The arc *ABC* is a quarter of a circle with centre *O* and radius 4.8 cm.
AC is a chord of the circle.

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

.... cm^2

(Total for question = 3 marks)

Q21. The diagram shows a semicircle drawn inside a rectangle.

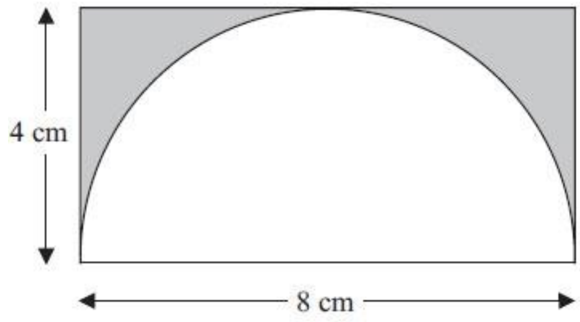


Diagram **NOT** accurately drawn

The semicircle has a diameter of 8 cm. The rectangle is 8 cm by 4 cm.

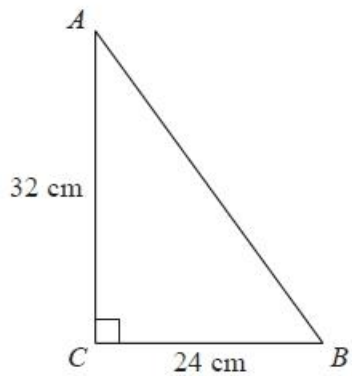
Work out the area of the shaded region. Give your answer correct to 3 significant figures.

. . . . cm^2

(Total for Question is 4 marks)

Q22. Here is a right-angled triangle.

Diagram **NOT** accurately drawn



(a) Work out the length of *AB*.

.... cm

(3)

Inderpal is making two mirrors.

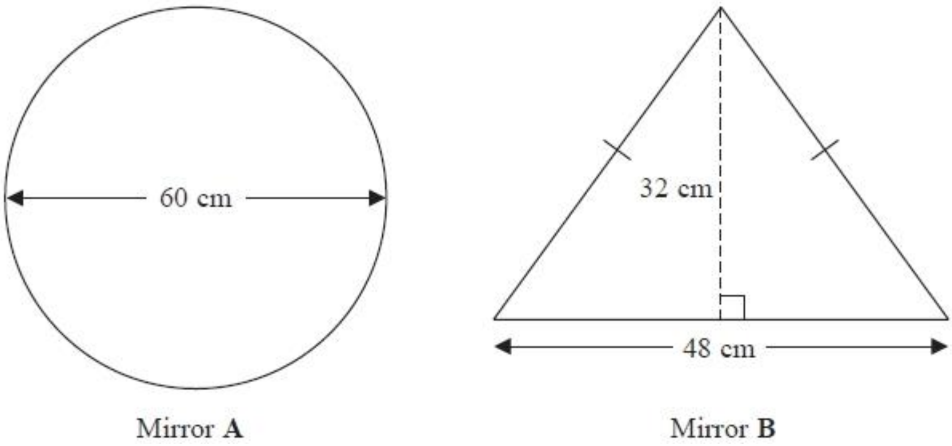


Diagram **NOT** accurately drawn

Mirror **A** is in the shape of a circle.
This mirror has a diameter of 60 cm.

Mirror **B** is in the shape of an isosceles triangle.
This mirror has base 48 cm and height 32 cm.

Inderpal buys metal strips to put around the edge of each mirror.
The metal strip is sold in lengths of one metre.
Each one metre length of metal strip costs £5.68

(b) Work out the total amount Inderpal pays. You must show all your working.

£...

(4)

(Total for Question is 7 marks)

Q23. Dan, Harry and Regan sell cars.

Dan sells *x* cars.
Harry sells 5 more cars than Dan.
Regan sells twice as many cars as Dan.

Write an expression, in terms of *x*, for the mean number of cars Dan, Harry and Regan sell.

....

(Total for question = 2 marks)

Q24.

ABC is a right-angled triangle.
A, *B* and *C* are points on the circumference of a circle centre *O*.
$AB = 5$ cm
$BC = 8$ cm

AOC is a diameter of the circle.

Calculate the circumference of the circle.
Give your answer correct to 3 significant figures.

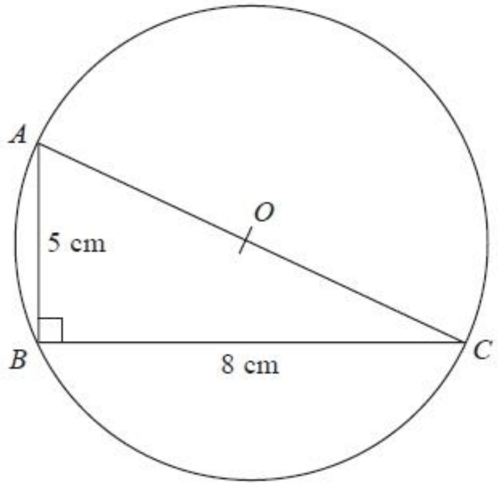


Diagram **NOT** accurately drawn

.... cm

(Total for question = 4 marks)

Q25. $p^3 \times p^x = p^9$

(a) Find the value of *x*.

$x =$ .... **(1)**

$(7^2)^y = 7^{10}$

(b) Find the value of *y*.

$y =$ .... **(1)**

$100^a \times 1000^b$ can be written in the form 10^w

(c) Show that $w = 2a + 3b$

(2)

(Total for question = 4 marks)

Q26. Jane invests £300 at a simple interest rate of 4.5% per year.
At the end of each year Jane gives the interest to a charity.

Work out the least number of years it will take for the total amount given to the charity to be greater than £50

....

(Total for question = 3 marks)

Q27. The value of a motor bike depreciates by 20% each year.

Brian says,

"After two years, the value of the motor bike will have reduced by 40%".

He is **wrong**. Explain why.

(Total for question = 3 marks)

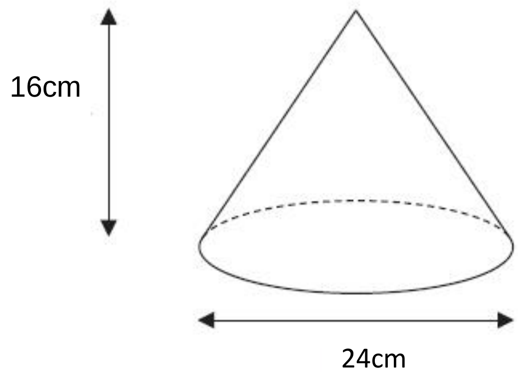
Q28. Franz invests £2500 for 2 years at $3\frac{1}{2}\%$ per annum compound interest.

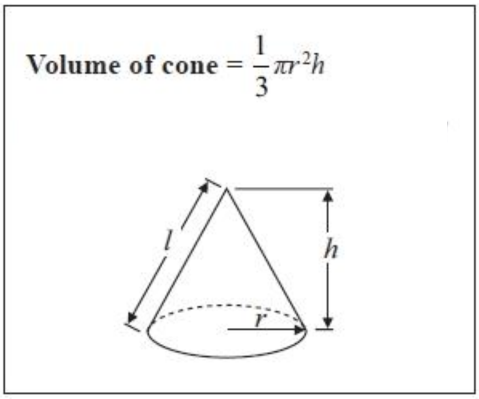
Work out the value of his investment at the end of 2 years.

£ ....

(Total for question = 3 marks)

Q29. The diagram shows a solid cone.





The diameter of the base of the cone is 24 cm.
The height of the cone is 16 cm.

Find the volume of the cone. Give your answer correct to 3 significant figures.

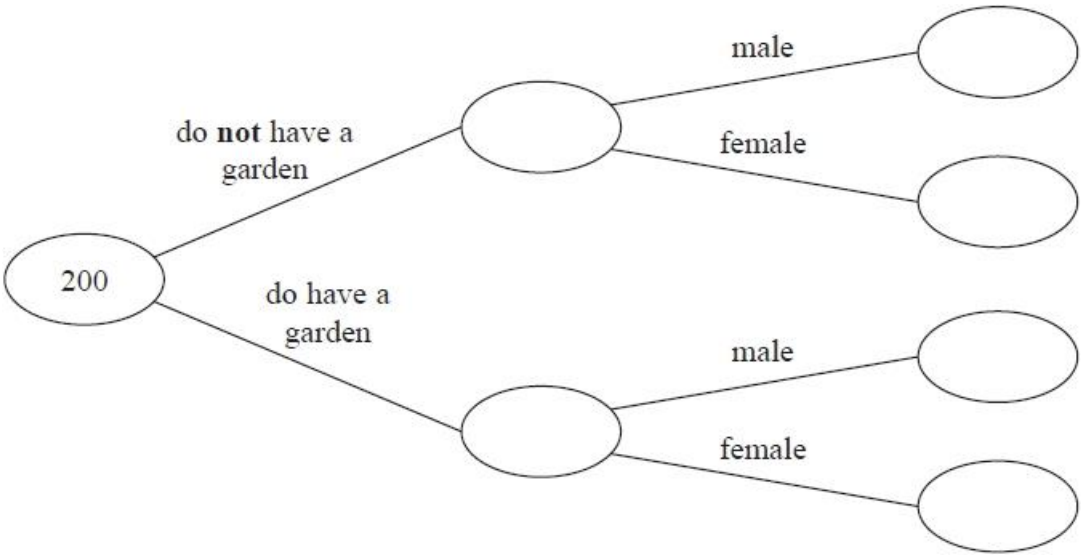
....

(Total for question is 5 marks)

Q30. 200 people live in a village.

23 people do **not** have a garden. 10 males do **not** have a garden. 95 people are male.

(a) Use this information to complete the frequency tree.



(3)

One of the people who does **not** have a garden is chosen at random.

(b) Write down the probability that this person is female.

.... (2)

(Total for question = 5 marks)

Q31. Some students went on an activity course.

Each student had to choose one activity from art or drama or music.

There were 41 students.
15 of the students chose music.
30 of the students were girls.

8 of the girls chose art.
No boys chose art.

Equal numbers of boys and girls chose drama.

Complete the two-way table.

	art	drama	music	total
girls				
boys				
total				41

(Total for question = 3 marks)

Q32. Chloe recorded the test marks of 20 students.

22	29	38	16	36	18	30	21	27	43
14	41	25	38	46	19	48	34	23	46

(a) Show this information in an ordered stem and leaf diagram.

(3)

One of these students is going to be chosen at random.

(b) Find the probability that this student has a test mark less than 28

.... (2)

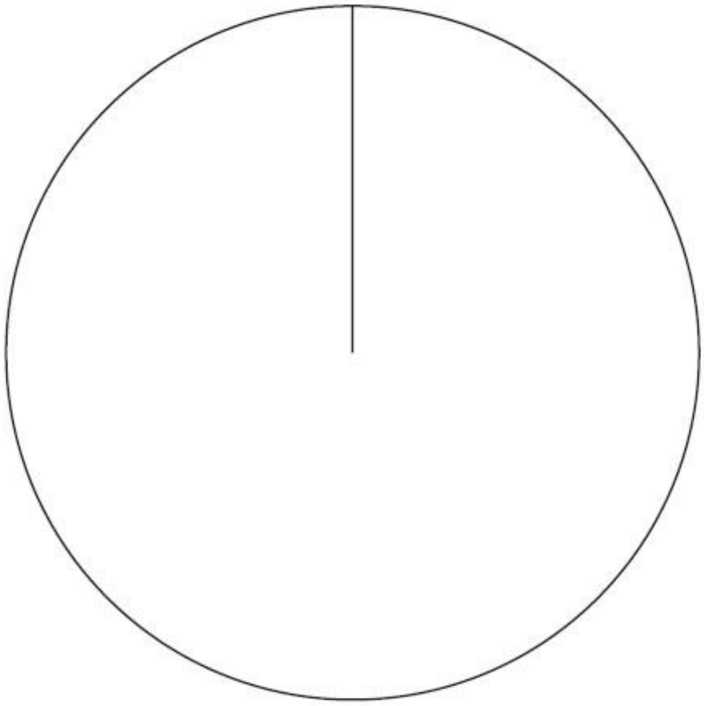
(Total for question = 5 marks)

Q33. A group of Year 10 students was asked to choose a new subject to study.

The table shows information about the choices.

Subject	**Number of students**	
construction	40	
hairdressing	56	
tourism	24	

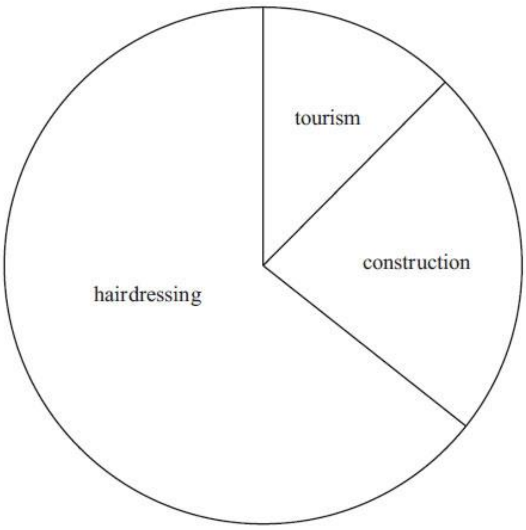
(a) Draw an accurate pie chart to show this information.



(3)

A group of Year 11 students was also asked to choose a new subject to study.

This pie chart shows information about their choices.



Danny says

"The pie charts show that hairdressing was chosen by more Year 11 students than by Year 10 students."

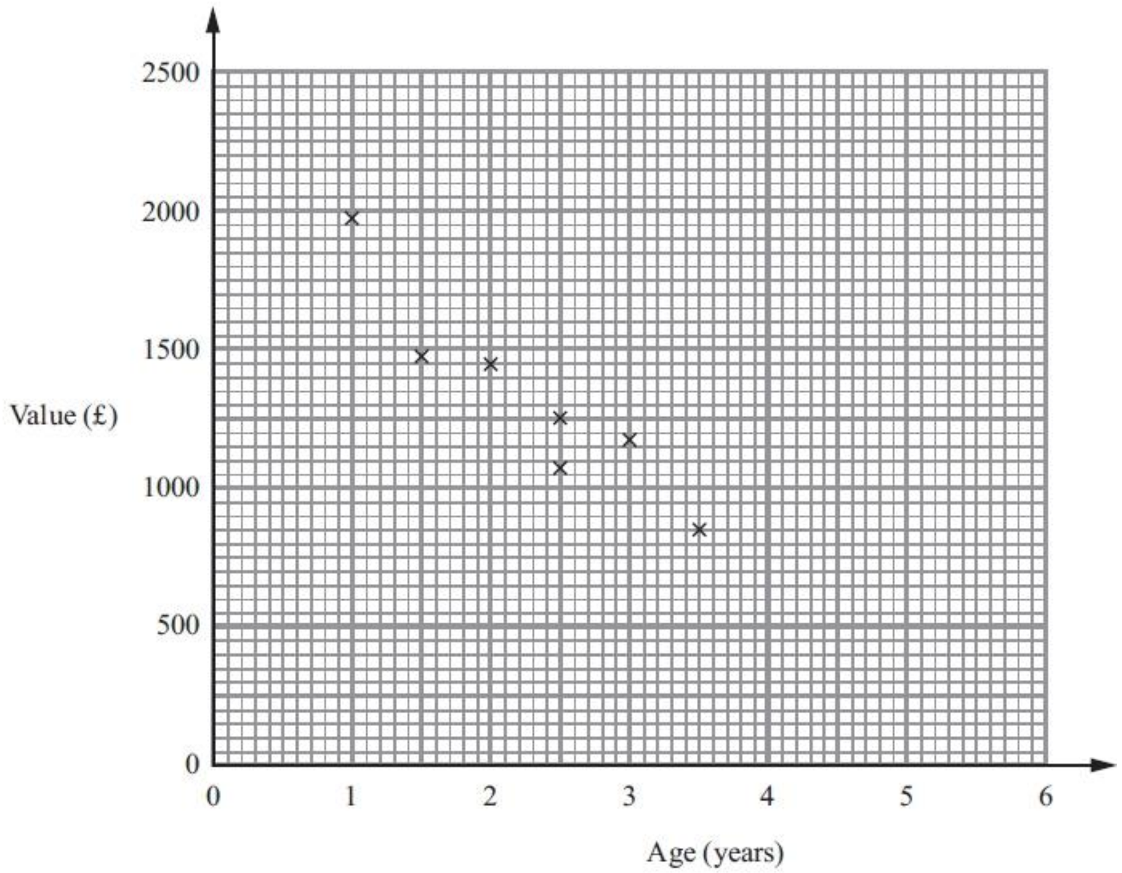
(b) Is Danny correct? . . . .

You must explain your answer.

....
....
....
.... **(1)**

(Total for Question is 4 marks)

Q34. The scatter graph shows information about the ages and values of seven Varley motor scooters.



Another Varley motor scooter is 5 years old.   It has a value of £300

(a) Show this information on the scatter graph. **(1)**

(b) Describe the relationship between the age and the value of Varley motor scooters.

....

.... **(1)**

A Varley motor scooter is 4 years old.

(c) Estimate its value.

£ . . . . **(2)**

(Total for Question is 4 marks)

Q35.

(a) Expand $3(x + 4)$

.... **(1)**

(b) Expand $x(x^2 + 2)$

.... **(2)**

(c) Factorise $x^2 - 6x$

.... **(1)**

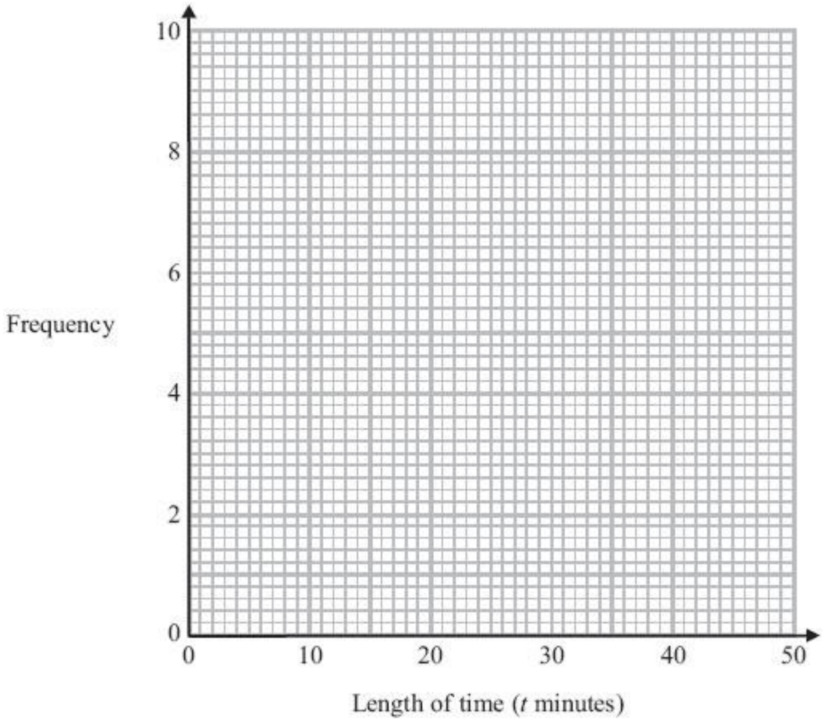
(Total for Question is 4 marks)

Q36. Helen went on 35 flights in a hot air balloon last year.

The table gives some information about the length of time, t minutes, of each flight.

Length of time (t minutes)	Frequency
$0 < t \leqslant 10$	6
$10 < t \leqslant 20$	9
$20 < t \leqslant 30$	8
$30 < t \leqslant 40$	7
$40 < t \leqslant 50$	5

On the grid below, draw a frequency polygon for this information.



(Total for Question is 2 marks)

Q37. Here is a list of numbers.

4 8 5 9 10 5 6 3 4

(a) Work out the median.

.... **(2)**

(b) Work out the mean.

.... **(2)**

(Total for Question is 4 marks)

Q38. Bob asked each of 40 friends how many minutes they took to get to work.

The table shows some information about his results.

Time taken (*m* minutes)	**Frequency**
$0 < m \le 10$	3
$10 < m \le 20$	8
$20 < m \le 30$	11
$30 < m \le 40$	9
$40 < m \le 50$	9

Work out an estimate for the mean time taken.

. . . . minutes

(Total for Question is 4 marks)

Q39. The stem and leaf diagram gives information about the numbers of tomatoes on 31 tomato plants.

0	8	8	9				
1	1	1	5	5			
2	1	2	2	6	7	8	8
3	0	2	5	5	7	9	
4	2	2	3	5	8	8	
5	1	1	3	4	7		

Key: 5|7 = 57 tomatoes

(a) Work out the median.

. . . . **(1)**

(b) Work out the interquartile range.

. . . . **(2)**

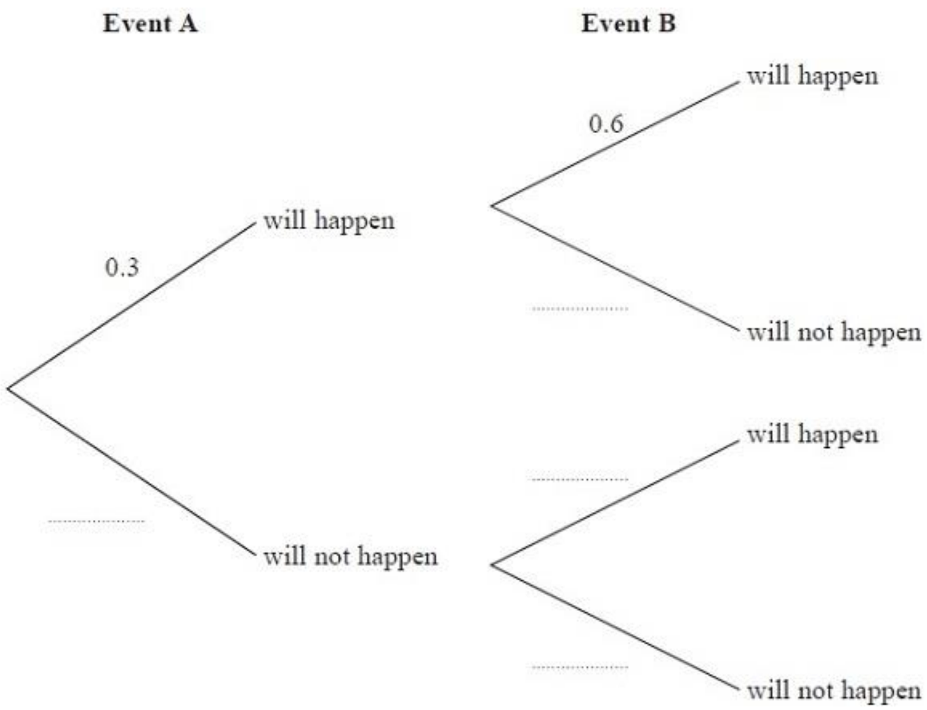
(Total for Question is 3 marks)

Q40. Event A and event B are independent events.

The probability that event A will happen is 0.3

The probability that event B will happen is 0.6

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that either event A will happen or event B will happen but not both.

.... **(2)**

(Total for Question is 4 marks)

Q41. Factorise $x^2 + 3x - 4$

....

(Total for question is 2 marks)

Q42. Josh plays a game with two sets of cards.

Set A	1	2	4	5	7
Set B	3	6	8	9	

Josh takes at random one card from each set.
He adds the numbers on the two cards to get the total score.

(a) Complete the table to show all the possible total scores.

Set A

Set B		1	2	4	5	7
	3	4	5	7	8	10
Set B	6	7	8	10		
	8					
	9					

(1)

(b) What is the probability that Josh's total score will be greater than 12?

.... **(2)**

Josh's year group are raising money for a sponsored skydive.

60 students are each going to play Josh's card game once.
Each student pays 50p to play the game.

Josh pays £1.50 to any player getting a total of 8

(c) Show that Josh can expect to make a profit of £21 from his game.

(4)

(Total for Question is 7 marks)

Q43. The point *A* has coordinates (2, 3). The point *B* has coordinates (6, 8).

M is the midpoint of the line *AB*.

Find the coordinates of *M*.

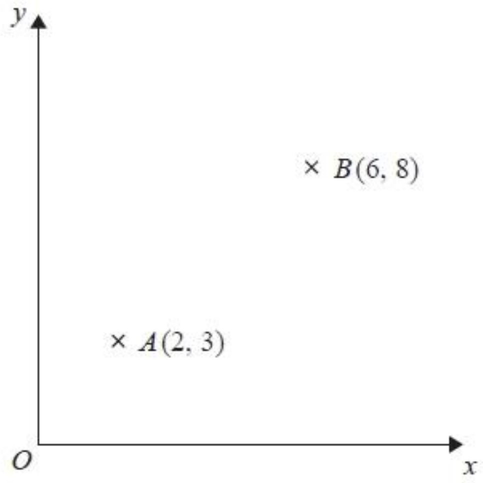


Diagram **NOT** accurately drawn

....

(Total for Question is 2 marks)

Q44.

$$q = \frac{p}{r} + s$$

Make *p* the subject of this formula.

....

(Total for question = 2 marks)

Q45. Solve the simultaneous equations

$$x + 3y = 12$$

$$5x - y = 4$$

$x =$ ....

$y =$ ....

(Total for question = 3 marks)

Q46.
Solve the simultaneous equations

$$4x + y = 10$$
$$x - 5y = 13$$

$x =$ ....

$y =$ ....

(Total for question = 3 marks)

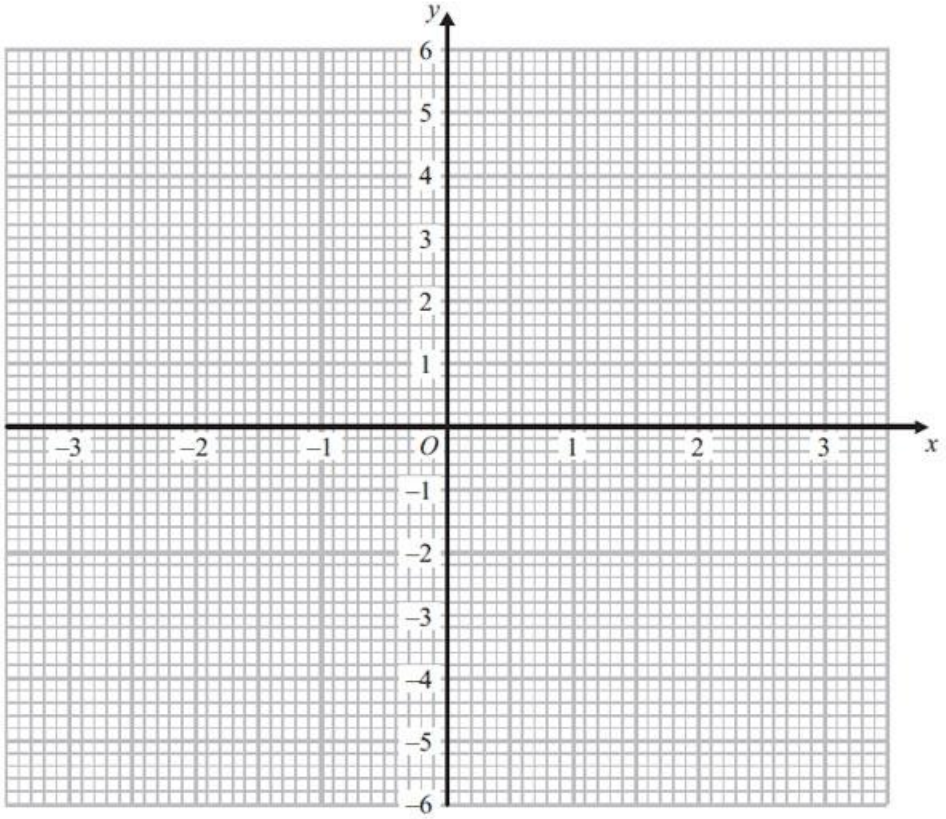
Q47.

(a) Complete the table of values for $y = x^2 - 4$

x	−3	−2	−1	0	1	2	3
y		0	−3			0	5

(2)

(b) On the grid, draw the graph of $y = x^2 - 4$ for $x = -3$ to $x = 3$



(2)

(Total for Question is 4 marks)

Q48. $-2 < n \leq 3$

n is an integer.

(a) Write down all the possible values of n.

.... **(2)**

$3x + 5 > 16$ x is an integer.

(b) Find the smallest value of x.

.... **(3)**

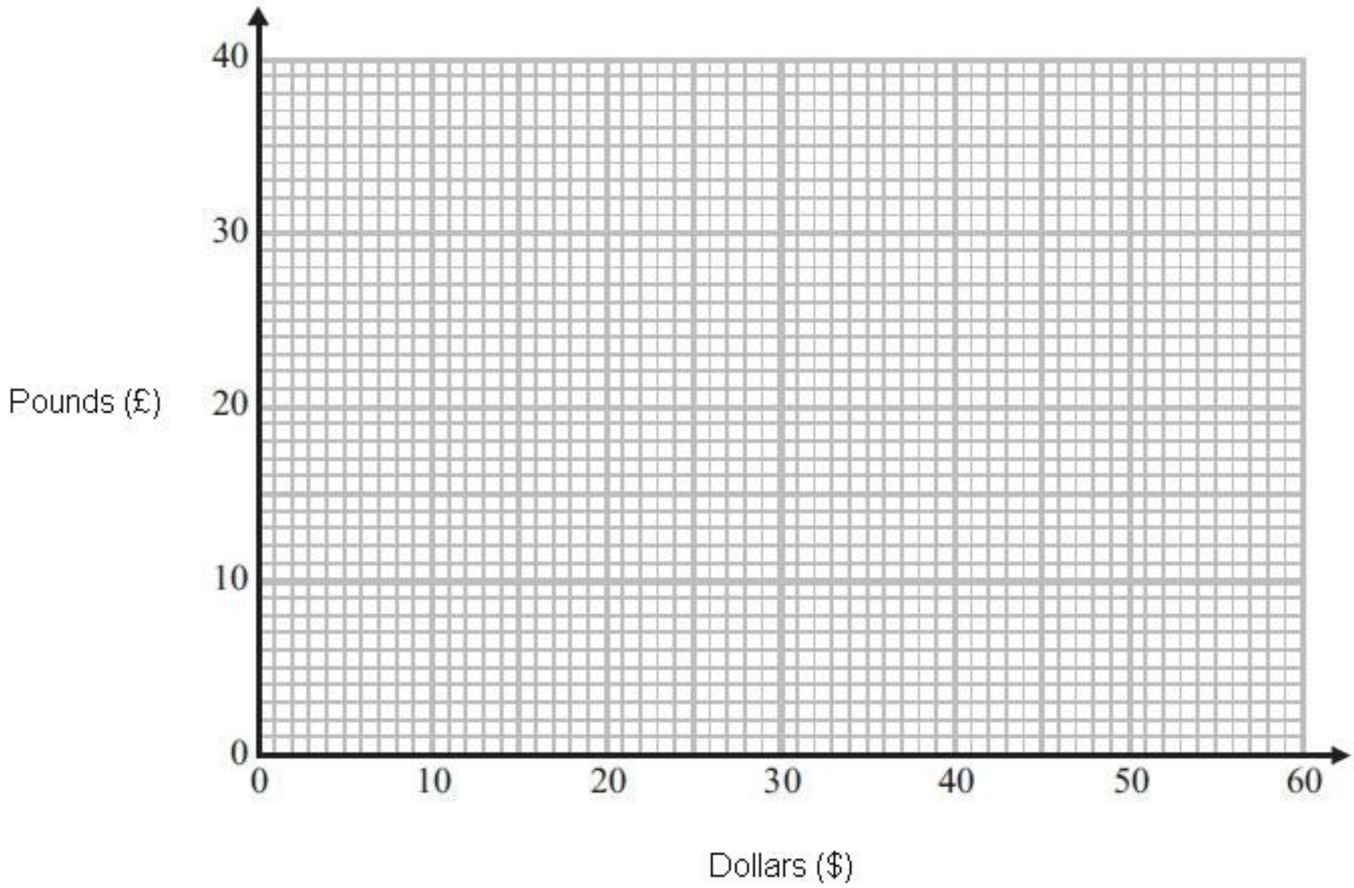
(Total for Question is 5 marks)

Q49.

The table shows how much some amounts of money in dollars ($) are when they are changed to pounds (£).

Dollars ($)	0	15	30	45	60
Pounds (£)	0	10	20	30	40

(a) On the grid, use this information to draw a line graph to change between dollars and pounds.



(2)

(b) Use your line graph to change

(i) £25 into $

$ . . . .

(ii) $50 into £

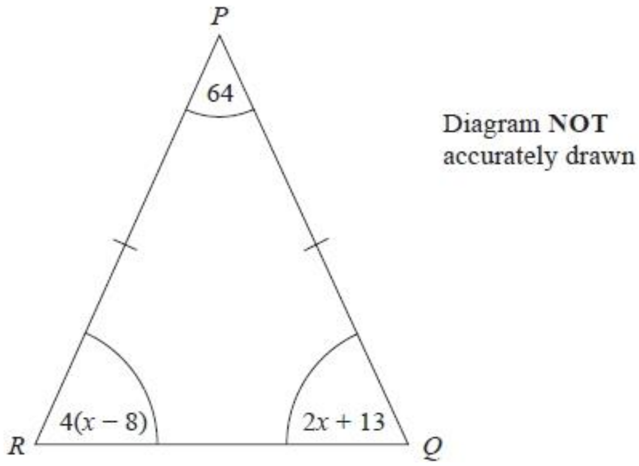
£ . . . .

(2)

(Total for Question is 4 marks)

Q50.

PQR is an isosceles triangle.



$PQ = PR$
All the angles are in degrees.

Work out the value of x.

x = ...

(Total for question = 4 marks)

TOTAL FOR PAPER IS 180 MARKS

Examiner's Report

Q1 - No Examiner's Report available for this question

Paper 1MA1:3F			
Question	**Working**	**Answer**	**Notes**
(i)		12	B1 cao
(ii)		2 or 5	B1

Q2 - No Examiner's Report available for this question

Question	Working	Answer	Notes
		8	M1 for finding the HCF of any two of the three numbers **or** for 2^5 and 3×2^4 and $2^3 \times 3^2$ A1 cao

Q3 Generally few candidates were able to score all 3 marks of this question.

A common incorrect answer for part (a) was 18.

In part (b) writing down the multiple of 7 from the list was done best.

In part (c) a significant number of candidates were unable to write down the square number from the list. A common incorrect answer seen was 11.

Question		Working	Answer	Mark	Notes
	(a)		12	1	B1 cao
	(b)		14	1	B1 cao
	(c)		16	1	B1 cao

Q4 Students should be encouraged to show all calculated angles on the diagram. Many students wrote 180 − 54 − 70 = 56 in the space provided below the diagram but did not specify which angle they were calculating so no marks could be awarded. Many added 54 and 70 to get 124 which scored no marks unless they also said that x = 124. However, most that did write 54 + 70 = 124 then went on to do 180 − 124 = 56 which scored no marks unless they either wrote <*DEF* = 56 or wrote 56 in an appropriate place on the diagram. Those students who did get an angle correct applying their knowledge of parallel lines often did not write an appropriate reason e.g. "<*EAC* = 54°" with "corresponding angles" was often seen rather than "alternate angles are equal". Most students did not score any communication marks as they were not able to supply an appropriate reason involving parallel lines (the colloquial terms Z or F angle were not acceptable). Those that did often lost the final mark for writing "opposite angles are equal" rather than "vertically opposite angles are equal".

Question	Working	Answer	Mark	Notes
*		124° with reasons	4	M1 for a method to find any angle eg. angle *DEF* = 180 – 70 – 54 (= 56) or angle *AEB* = 70 or angle *EAB* = 54 or angle GEB = 180 – 70 (= 110) A1 for x =124 NB: Angles may be shown on the diagram C2 for full reasons, appropriate to their given method, with no additional reasons (C1 for one appropriate reason relating to parallel lines) Possible reasons: corresponding angles are equal; alternate angles are equal co-interior (allied)angles add up to 180; angles on a straight line add up to 180; angles in a triangle add up to 180 vertically opposite angles are equal; the exterior angle of a triangle is equal to the sum of the interior opposite angles; angles at a point add up to 360;

Q5 This five-mark geometry question gave a good spread of marks. There were many interesting ways of spelling octagon seen in part (a) but marks were awarded as long as the meaning was clear. In part (b) many candidates copied the diagram of the octagon or drew a hexagon but most candidates drew a pentagon and we did not demand that a ruler was used. Part (c) was well attempted with most candidates realising that that they had to add all the angles and subtract the total from 900 but only about a half of candidates gained all three marks in this part.

		Working	Answer	Mark	Notes
	(a)		Octagon	1	B1 cao
	(b)		Pentagon drawn	1	B1 cao
	(c)		121	3	M1 for attempted sum of given angles (=779), or subtraction of all given angles from a number > 900 M1 for 900 – '779' or subtraction of all given angles from 900 A1 cao

Q6. Throughout this question, students appeared more confident with scale drawing than with bearings. In part (a) where a bearing was measured only about 40% gave the correct 120° with some answers of 60° blank responses indicated that some may not have been equipped with a protractor.

The vast majority of students picked up some marks on parts (b) and (c) but the main issue was one of accuracy. In part (b) the distance on the map had to be measured to within 2mm but many students were 3 mm away from the correct value.

Similarly, students who appeared to know what to do in part (c) lost one or even both marks due to a lack of care with their actual drawing. Again, students need to be aware that the tolerances allowed here were ± 2mm and ± 2°

Paper: 5MB3F_01					
Question		Working	Answer	Mark	Notes
	(a)		118 - 122	1	B1 for 118 – 122
	(b)		17.5	2	M1 for 2.5 × "7" where "7" is 6.8 – 7.2 A1 for 17 - 18
	(c)		Position marked	2	B1 for school marked due North of church B1 for distance of 6cm

Q7. Instead of using the area of the rectangle to work out the length of *BD*, many students assumed it to be 4.5 cm and gained no marks at all. Those who worked out the length of *BD* as 5 cm often went on to work out the area of the triangle correctly. The most common error was not dividing by 2 after multiplying 4.5 by 5. Pythagoras' Theorem was often used to calculate the length of *CD* which was not needed.

Question		Working	Answer	Mark	Notes
			11.25	3	M1 for 40 ÷ 8 (=5) M1 (dep) for finding the area of the triangle eg "5" × 4.5 ÷ 2 A1 cao

Q8. In part (a) it was disappointing to see a significant number of students giving the answer as 35 after a division of 100. In contrast part (b) was far more successful. Part (c) has always caused some difficulty for students, and it was the same here. Most multiplied by 100. Anyone giving the multiplier as 100^2 went on to give the correct answer.

PAPER: 5MB3F_01					
Question		Working	Answer	Mark	Notes
	(a)		3.5	1	B1 cao
	(b)		3000	1	B1 cao
	(c)		30000	2	M1 for 3 × 100 × 100 oe A1 cao

Q9. Candidates struggled with writing the lengths of the sides of the trapezium algebraically which made accessing this question difficult. Candidates could get some marks though for a numerical approach though many wasted time with exhaustive but fruitless trial and improvement attempts.

PAPER: 1MA0_2F					
Question		Working	Answer	Mark	Notes
			$5\frac{2}{3}$	4	M1 for $AB = 2x$ or $DC = 2x + 4$ or for 38 – 4 (= 34) M1(dep) for $x + x$ + '$2x$'+ '$2x + 4$' or for "38 – 4" ÷ 6 M1 for '$6x + 4$' = 38 A1 for $5\frac{2}{3}$ oe **N.B.** Accept answers in the range 5.6 to 5.7 if M3 scored **SC** if M0 then B2 for an answer in the range 5.6 to 5.7

Q10. No Examiner's Report available for this question

Question	Working	Answer	Mark	Notes
		construction	B2 (B1)	correct construction showing all necessary arcs. (pair of intersecting arcs centred on A and B)

Q11. Most students were able to draw an angle of 40° in part (a). A small number drew an angle of 140°. In part (b) the majority of students gained at least one mark. Those who used a pair of compasses and drew the appropriate arcs were usually successful. A significant number of students, however, gained only one mark because they failed to show construction arcs and merely drew the required triangle instead of constructing it – some used a vertical line from the centre of the base as a guide.

Question		Working	Answer	Mark	Notes
	(a)		Angle drawn	1	B1 cao
	(b)		Triangle drawn	2	M1 intersecting arcs of radii 6 cm or an accurate triangle with no arcs A1 for a fully correct triangle with arcs

Q12. Part (a) was usually well answered; the main error was in finding the difference between 1730 and 1810. In contrast, part (b) was not well answered. Some understood it was speed as evidenced by the drawing of an SDT triangle but sometimes this was incorrectly produced. Many thought the required calculation was 30 ÷ 20 and could gain no further credit as a result. 20 ÷ 30 was a better approach, but rounding this to just 0.6 inevitably led to inaccurate calculations, usually leading to 36 minutes and 18.10 Many successful students who calculated the 40 correctly then failed to get the final (QWC) mark since they did not explain fully how they knew David could get home on time.

PAPER: 1MA0/2F				
Question	Working	Answer	Mark	Notes
(a)		25	1	B1 cao
*(b)		yes with correct comparative figures	3	M1 for method to calculate journey time travelling at 30 mph, eg $\frac{20}{30}$ (=0.66…) or 40 (mins) M1 (dep) for method to work out arrival time at home, (consistent units), eg 18 10 + "40 mins" (=18 50) C1 for yes with comparison of 40 minutes with 50 minutes or stating arrival time home as 18 50 OR M1 for method to calculate speed in order to get home by 1900 eg $20 \div \frac{50}{60}$ (= 24 mph) M1 (dep) for stating speed as 24 mph C1 for yes with supporting calculations showing speed as 24 mph

Q13. This question was very poorly answered with few students knowing the formula Volume = Mass/Density. The great majority either multiplied the mass by the density or divided density by the mass.

Again conversion between units was poor, many not knowing that 1kg = 1000g.

Question	Working	Answer	Mark	Notes
		648	M2	a complete method, eg 12.5 × 1000 ÷ 19.3
			[M1	for using volume = mass/density, eg 12500 ÷ 19.3 (condone inconsistent units or incorrect conversions) may be implied by digits 647... or 648...]
			A1	for answer in range 647 to 648

Q14. Responses to this question were disappointing with less than a half of candidates able to find the volume of the cuboid. Many candidates merely added the three measurements given on the diagram whilst others gave varying combinations of multiplying and adding the dimensions of the cuboid, sometimes confusing volume with the total length of the edges or with the surface area. Those candidates showing a correct method sometimes wrote down "1600" as their answer. Candidates are advised to check the number of zeros after such calculations. Of those candidates who worked out the volume correctly, many missed out suitable units or gave incorrect units (usually cm or cm^2). Some candidates gave the correct units but earned no marks for their working. They were awarded one mark.

Question		Working	Answer	Mark	Notes
		20 × 20 × 40 = 16000	16000 cm^3	3	M1 for 20 × 20 × 40 or 0.2 × 0.2 ×0.4 A1 for for 16 000 or 0.016 B1 for cm^3 or m^3 (consistent with working)

Q15. Very few students gained marks on this question with less than 5− gaining full marks. A few showed beginning steps to find the cross-section area or cylinder volume but the relatively large numbers involved and conversion aspect presented too much of a challenge for most. The most successful students did set out their working well and often gave a descriptive commentary which may well have helped them to structure their solution.

Question		Working	Answer	Mark	Notes
			77 – 77.2	4	M1 for $\pi \times 40^2 \times 90$ (= 452389. ..) M1 for "452389" – 65000 (= 387389. ...) M1 (dep on at least M1) for "387389. .." ÷ ($\pi \times 40^2$) A1 for answer in the range 77 to 77.2 OR M1 for $\pi \times 40^2$ (= 5026. ..) M1 for 65000 ÷ "5026. .." (= 12.93....) M1 (dep on at least M1) for 90 – "12.93" A1 for answer in the range 77 to 77.2

Q16. About a half of the candidates used the wrong formula for the circumference of the circle with the area formula often being used. Full marks were awarded for those candidates that gave an answer in the range 439.6 to 440 but only one mark if they rounded to down to 439 on the answer line unless the correct answer was seen in the working space whereupon they could score both marks.

Question	Working	Answer	Mark	Notes
		440	2	M1 for 140 × π or 439 A1 for 439.6 – 440

Q17. Over one third of students recognised the transformation as an enlargement and gave the correct scale factor but correct identification of the centre of enlargement was very rare indeed. Many students lost marks through giving multiple transformations as answers, mostly in an attempt to give information about the position of the image in the absence of a centre of enlargement. Typically, a translation was described or vector given.

Question		Working	Answer	Mark	Notes
			enlargement scale factor 3 centre *O*	3	B1 for enlargement B1 for scale factor 3 B1 for (centre) *O* oe NB: B0 for any combination of transformations

Q18. Most candidates drew the two lines of symmetry - sadly many of these also put in additional lines that looked like diagonals.

Part (b), the idea of rotational symmetry was not well known with a wide variety of wrong answers, including 360° and 5.

Question		Working	Answer	Mark	Notes
	(a)		2 lines of symmetry drawn	2	B2 for fully correct answer accept freehand lines (B1 for a correct line of symmetry drawn – ignore extra lines)
	(b)		6	1	B1 6, six

Q19. Many students met with some success in this question. In part (a) there were some students who rotated the shape by 90° rather than 180°. Sometimes the shape was not accurately drawn in the correct position.

In part (b) students were not careful enough counting squares, and sometimes positioned the shape within one square of what was needed. Some failed to take account of the minus signs in determining direction of move.

Question	Working	Answer	Mark	Notes
(a)		(−2, 1) (−4, 1) (−2, 2) (−5, 2)	B1	Shape labelled **A**
(b)		(1, −4) (3, −4) (1, −5) (4, −5)	B1	Shape labelled **B**

Q20.
No Examiner's Report available for this question

Question	Working	Answer	Notes
	$\frac{1}{4} \times \pi \times 4.8^2$ $\frac{1}{2} \times 4.8 \times 4.8$ $\frac{1}{4} \times \pi \times 4.8^2 - \frac{1}{2} \times 4.8 \times 4.8$	6.58	B1 for use of formula for area of a circle P1 for complete process to find area of shaded region A1 for 6.56 – 6.58

Q21. A fairly small number of candidates achieved full marks on this question. Candidates often arrived at a correct final answer between 6.86 and 6.88 from an incorrect method. The majority of candidates who arrived at the final answer gave it to three decimal places as opposed to three significant figures, but were not penalised for this.

It was disappointing to note that a number of candidates failed to score. Candidates commonly used the wrong formula for calculating the area of a circle, finding the circumference instead. A small number of candidates were able to find the area of the circle correctly but then failed to halve this, scoring no further marks. This question highlighted many candidates' poor knowledge of formulae associated with circles.

		Working	Answer	Mark	Notes
			6.87	4	M1 for $\pi \times 4 \times 4$ or $\pi \times 4^2$ or $\pi \times 16$ or $\pi r^2 = 50.26...$ M1 for 'πr^2' ÷ 2 M1 for 8 × 4 − 'πr^2 ÷ 2' A1 for 6.86 – 6.88

Q22.

Candidates understood they had to find the missing side *AB* in this right angled triangle but often just added the two sides of 32 and 24. Only about a third of candidates realised they had to square and add the lengths if the right angled triangle with many subtracting instead.

In part (b) a lot of the candidates assumed they had to find the areas of the two mirrors rather than find the perimeter of the mirrors and so scored no marks. Very few candidates were able to give a fully correct solution to this question though partial credit was often earned for trying to find the circumference of the circle and the perimeter of the triangle. Those who did try to find the perimeter did not take account of the fact that the metal strip is sold in lengths of one metre when trying to find the cost. Most candidates did not associate part (a) with part (b).

PAPER: 1MA0_2F					
Question		Working	Answer	Mark	Notes
	(a)		40	3	M1 for $32^2 + 24^2$ M1 for $\sqrt{1600}$ or $\sqrt{(32^2 + 24^2)}$ A1 cao
	(b)		22.72	4	M1 for use of $\pi \times 60$ oe M1 for method to calculate perimeter of triangle, eg 2 × '40' + 48 (=128) M1(dep M2) for complete method to find total length of strip for both mirrors or to find the cost of strip for one mirror, eg 2 × £5.68 A1 for £22.72 from correct working

Q23.

This question was answered very poorly. Students struggled to write down correct expressions for the number of cars Harry and Regan each sold. Common errors included writing $5x$, rather than $x + 5$, for the number of cars Harry sold and either x^2 or $x + 5 \times 2$, instead of $2x$, for the number of cars Regan sold. Some students were awarded one mark for adding three correct expressions but $4x + 5$ was usually then given as the final answer. Very few students attempted to divide their total by 3. Many students did not appear to appreciate that Regan sold twice as many cars as Dan or that the question asked for the *mean number* of cars sold.

PAPER: 5MB1F_01				
Question	Working	Answer	Mark	Notes
		$\frac{x+x+5+2x}{3}$	2	M1 for intention to add x, $x+5$, $2x$ or $4x+5$ seen or ambiguous answer, e.g. "$4x+5$" ÷ 3 A1 for $\frac{x+x+5+2x}{3}$ oe

Q24.

Some students were able to use Pythagoras' Theorem to calculate the diameter of the circle. However few students were able to move beyond this point many used area instead of circumference. This question was not well answered by students at this level.

5MB3F/01 June 2015				
Question	Working	Answer	Mark	Notes
		29.6	4	M1 for $8^2 + 5^2$ or 64 + 25 or 89 M1 (dep) $\sqrt{"8^2" + "5^2"}$ (= 9.4..) M1 for "9.4.." × π A1 for 29.5 – 29.65

Q25. In part (a) addition was required; some multiplied and gave the answer as 3.

In part (b) multiplication was required; some added and gave the answer as 8.

Students very rarely scored marks in part (c). A clear lack of conceptual understanding of standard form (or indices) was evident with most students missing the powers of 10 link to gain the correct algebraic power. Many tried to solve the equation to gain a numerical value with the use of the 3 and 2 as coefficients of 100 and 1000 rather than showing their derivation.

Question	Working	Answer	Mark	Notes
(a)		6	B1	cao
(b)		5	B1	cao
(c)		Shown	M1	for writing 100^a or 1000^b as a power of 10 ($=10^{2a}$ or 10^{3b}) or 10^{2a+3b} or $100 = 10^2$ and $1000 = 10^3$
			C1	for complete chain of reasoning leading to conclusion

Q26. Many students correctly found 4.5% of 300. However not all could then divide their answer into 50 or repeatedly add to find out the number of years required. A few students used compound interest and there was a special case for this approach but centres are encouraged to ensure that students check they have answered the question asked.

Question	Working	Answer	Mark	Notes
		4	3	M1 $\frac{4.5}{100} \times 300$ (=13.5) or $\frac{104.5}{100} \times 300$ (=313.5) oe M1 50 ÷ "13.5" (=3.7) or at least 3 repeated addition of "13.5" A1 cao SCB1 for $1.045^n \times 300$

Q27. A well answered question in which students preferred to select a value for the motor bike, and then proceeded to show how the depreciation differed for a simple, or compound approach. With a clear comparison at the end this could attract full marks. Lengthy expositions without any mathematical calculation, on the other hand, gained little credit.

Question		Working	Answer	Mark	Notes
*			36% depreciation	3	M1 for 0.8 × 0.8 (=0.64) M1 for 1 – "0.64" (=0.36) C1 for 36% (depreciation) oe or compares cost with 40% reduction OR (uses a trial value, eg 1000) M1 for $1000\times(0.8)^2$ (=640) M1 for (1000 – 640) ÷ 1000 (=0.36) C1 for 36% (depreciation) oe or compares cost with 40% reduction OR M1 for 0.2 × 0.2 (=0.04) M1 for 0.2 + 0.2 – "0.04" (=0.36) C1 for 36% (depreciation) oe or compares cost with 40% reduction OR C1 only for identifying the 2nd 20% reduction is off the reduced amount at the end of the first year

Q28. This question was a good discriminator. There were a good number of fully correct solutions but more frequently students scored only part or no marks because they did not fully understand the concept of compound interest or were unable to show a correct method for calculating $3\frac{1}{2}\%$ of a quantity.

5MB1H_01 November 2015					
Question		Working	Answer	Mark	Notes
		2500 + 2500 × 3.5÷100 = 2500 + 87.50 = 2587.50 2587.50 + 2587.50 × 3.5 ÷ 100 = 2587.50 + 90.5625	2678.06	3	M1 for 2500 × 1.035 or 2500 + 2500 × 0.035 oe or for 2587.5(0) or 87.5(0) or 8750 or 2412.5(0) M1 (dep) for "2587.5" × 1.035 or for "2587.5" + "2587.5" × 0.035 or for "2578.5" + "90.56(25)" or for 2678 or 2678.1(0) or 2678.07 or 2678.06… A1 cao NB: if correct answer seen then ignore any extra years Alternative method: M2 for 2500 × 1.035ⁿ where n ≥ 2 or for 2678 or 2678.07 or 2678.06… A1 cao

Q29. No Examiner's Report available for this question

Paper 1MA1:3H			
Question	Working	Answer	Notes
	$l = 20x$ $x = 3$	20736	P1 for a method to find the slant height of the cone eg $\sqrt{16x^2 + 12x^2}$ or by similar triangles and Pythagorean triples P1 for setting up an equation for the curved surface area in terms of x eg $2160\pi = \pi \times 12x \times 20x$ P1 for complete method to find the value of x P1 for a method to find the volume A1 cao

Q30. This was very well understood and full marks were gained by the vast majority of students in both parts.

In part (a) a minority of students put the frequencies in the wrong order in (usually) two of the right-hand boxes; some gave the frequencies incorrectly as probabilities of 200.

In part (b) the most common incorrect answer was $\frac{13}{200}$ (which gained 1 mark) where students had not read the question properly. Very rarely did students use incorrect notation for the probability.

Question	Working	Answer	Mark	Notes
(a)		23, 177	C3	Completes all information correctly.
		10, 13, 85, 92	(C2	3 or 4 correct frequencies or all correct probabilities)
			(C1	2 correct frequencies)
(b)		$\frac{13}{23}$	M1	ft oe for $\frac{a}{23}$, $a < 23$ or $\frac{13}{b}$, $b > 13$
			A1	ft oe from (a)

Q31. A well understood question with almost all students scoring at least one mark and many scoring all three. A surprising number of students incorrectly used tallies in their response to this question.

5MB1F/01 June 2015				
Question	**Working**	**Answer**	**Mark**	**Notes**
	<table><tr><td></td><td>A</td><td>D</td><td>M</td><td>T</td></tr><tr><td>G</td><td>8</td><td>9</td><td>13</td><td>30</td></tr><tr><td>B</td><td>0</td><td>9</td><td>2</td><td>11</td></tr><tr><td>T</td><td>8</td><td>18</td><td>15</td><td>41</td></tr></table>	Correct Table	3	B3 for fully correct table (B2 for at least 7 of their entries correct) (B1 for at least 4 of their entries correct)

Q32. In part (a), stem and leaf diagrams were usually accurate. However many students failed to provide a key. Keys drawn were usually correct, although some were spoiled by "students" being written as the unit. It was noticeable this year that very few unordered diagrams were seen. One common omission was the value of 48

In part (b), very few students offered a probability in an unacceptable form. The greater majority of answers were correct; $\frac{9}{28}$ and $\frac{11}{20}$ were the most common incorrect answers although both did gain credit for being partly correct. Students should be encouraged to leave answers as fractions; when conversion to a decimal is attempted errors can occur.

Question		Working	Answer	Mark	Notes
	(a)		1 | 4 6 8 9 2 | 1 2 3 5 7 9 3 | 0 4 6 8 8 4 | 1 3 6 6 8	3	B2 for correct ordered stem and leaf (B1 for fully correct unordered, or ordered with one error or omission) B1 (indep) for key (units not required but must be correct if stated) eg. 1 | 4 = 14 (marks)
	(b)		$\frac{9}{20}$ oe	2	B2 for $\frac{9}{20}$ oe or ft from stem and leaf diagram (B1 for $\frac{x}{20}$ where $x < 20, x \neq 9$ or $\frac{9}{y}$ where $y > 9$ or ft from stem and leaf diagram)

Q33. There is clear evidence that many candidates attempting this question were doing so without the aid of a protractor. Drawing angles of 40, 56, 24 resulted in four sectors, which did not appear to bother some candidates. The majority drew a pie chart with three sectors that only approximated to the proportions of the number of students in each category.

Part (b) was also poorly answered, with too many answers referring to the sizes of the sectors or angles, rather than focussing on the actual number of students (which we did not know). Although most tried to justify a reason for "no", there were equally some acceptable justifications for an answer of "yes".

Question		Working	Answer	Mark	Notes
	(a)	construction = 120° hairdressing = 168° tourism = 72°	120° 168° 72°	3	M1 for correct working to find an angle (could be implied by one angle drawn correctly on the pie chart. A1 all three angles drawn ±2° B1 (dep on M1) correct labels NB: stating the angles is not labels
	(b)		explanation	1	B1 ft reason given eg NO and "we don't know the actual figures", "there could be less Y10 students", or refers to the fact that the totals for the pie charts (or the sample groups) could be different NB: YES could also be justified.

Q34. This question was well attempted with candidates scoring 3 or 4 marks.

In part (a) this question was well attempted with very few blank responses seen. Most candidates correctly plotted the value but too many plotted at 250, 350 or were just incorrect.

In part (b) this question was well attempted with few blank responses seen. More candidates attempted to explain the relationship, as asked, than wrote negative correlation. The more able candidates were able to describe the relationship correctly and sufficiently clearly but the less able tended to state facts about specific points than describe a trend.

In part (c) candidates were most successful on this part of question 12. Most did not draw a line of best fit but gained full marks for an answer in range. The most common correct answer was 500. Incorrect answers were very varied.

Question		Working	Answer	Mark	Notes
	(a)		(5, 300) plotted	1	B1 for point plotted at (5, 300) allow ± ½ square tolerance
	(b)		The greater the age the less the value	1	B1 for the greater the age the less the value (price, cost etc.) Accept negative correlation but "negative" or "negative relationship" gets B0
	(c)		500 to 800 inc.	2	B2 for an answer in the range 500 to 800 (inc.) OR M1 for a single straight line segment with negative gradient that could be used as a line of best fit A1 ft from their line of best fit [SC: B1 ft reading from their single straight line with negative gradient at Age = 4 if M0 scored]

Q35. No parts of this question were answered well. Algebra is still an area of uncertainty for this level of candidate. In part (a), answers of $3x + 4$ and $7x$ were the usual errors seen. In part (b), $x^2 + 2x$ and $2x^2 + 2x$ were the best of the incorrect answers of candidates showing some algebraic manipulative ability. Some achieved the correct expansion but then incorrectly tried to simplify their answer, losing the mark. In part (c), $x^2 - 6$, $x(x - 3)$ and $x(x - 6x)$ were the best of the 'near misses'.

		Working	Answer	Mark	Notes
	(a)		$3x + 12$	1	B1 for $3x + 12$ or $12 + 3x$
	(b)		$x^3 + 2x$	2	M1 for the intention to multiply both terms in the bracket by x A1 for $x^3 + 2x$ OR B2 for $x^3 + 2x$ [B1 for x^3 or $2x$ seen]
	(c)		$x(x - 6)$	1	B1 for $x(x - 6)$ or $(x - 6)x$

Q36 There remains a lot of confusion about frequency polygons. Weaker candidates confuse them with bar charts, or plot the points at the ends of the interval. Others plot them as if a scatter diagram, without joining the points. What to do at the ends is a further confusion, and some joint the two end points. Candidates who drew a bar chart gained some credit if the midpoints of the top of the bars was indicated, but no credit if the corners were used instead. Candidates who superimposed a polygon on top of the bar chart could get full marks.

Q37. It is encouraging to report that over half of all candidates gave fully correct responses to this question. It was common to see the correct method for each part clearly written in the working space. Where candidates had identified a correct method, some made careless errors.

For example the answer "5.5" was seen often for part (a) and in part (b) candidates often totalled the numbers correctly only to divide their total by 8 or 10 instead of by 9. In working out the mean candidates often omitted brackets and wrote "4 + 8 + 5 + 9 + 10 +5 + 6 + 3 + 4 ÷ 9" instead of the correct "(4 + 8 + 5 + 9 + 10 +5 + 6 + 3 + 4) ÷ 9". When trying to find the median many candidates forgot to order the list before selecting the "middle number".

A significant minority of candidates were confused between the different statistical measures and it was not uncommon to see the mean worked out for part (a) and the median for part (b).

The range also appeared in some candidates' responses to either part (a) or Part (b).

Question		Working	Answer	Mark	Notes
	(a)	3 4 4 5 5 6 8 9 10	5	2	M1 for ordering the 9 numbers A1 cao
	(b)	(4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4)÷9 54 ÷ 9	6	2	M1 for (4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4) ÷ 9 or 54 ÷ 9 A1 cao

Q38. **T**he responses to this question were very mixed. When candidates knew how to tackle the question the use of the mid-interval values was very much in evidence but there were still some who used either the upper or the lower values of the class intervals. A significant number of candidates worked out the correct answer but then felt the need to round this to 28 on the answer line or to give the answer as the class interval itself. Those who had shown 28.25 in the working were not penalised for doing this. Some candidates realised that '*fx*' could be involved and did the appropriate calculations but then decided not to use these results, choosing instead to divide the total of the frequencies by the number of class intervals (a very common incorrect method) and gaining no marks.

Question		Working	Answer	Mark	Notes
		5×3+15×8+25×11+35×9+45×9 =1130 1130 ÷ 40	28.25	4	M1 for finding *fx* with *x* consistent within intervals (including the end points) allow 1 error M1 (dep) for use of all correct mid-interval values M1 (dep on first M1) for Σ*fx* ÷ 40 or Σ*fx* ÷ Σ*f* A1 for 28.25 or 28 ¼

Q39. Part (a) was well answered although some candidates failed to interpret the diagram correctly and gave 2 rather than 32 as the median.

In part (b) 49 was a common incorrect answer from those candidates who worked out the range rather than, as requested, the interquartile range. Others attempted to work out the interquartile range by halving the range. Some candidates worked out that the lower and upper quartiles would come from the 7.75th and 23.25th (or 8th and 24th) values but then went onto subtract 7.75 from 23.25 rather than use the values of the variable associated with them.

Question		Working	Answer	Mark	Notes
	(a)		32	1	B1 cao
	(b)	LQ = 21 UQ king = 45	24	2	M1 for 45 **or** 21 **or** 43.5 **or** 19.5 **or** 7.75th **or** 8th **or** 23.25th **or** 24th (al of the above may be seen in working space or indicated on S&L) **or** Clear attempt to find UQ and LQ from list of values or in stem and leaf diagram A1 cao

Q40. Most provided a good tree diagram, though some thought that the only values that could be used were 0.3 or 0.6. In part (b) a significant minority worked with only one combination rather than two; the most common error was in adding the probabilities rather than multiplying. Candidates who converted the decimals to fractions made life harder for themselves, though these were acceptable as equivalents (if correct).

Question		Working	Answer	Mark	Notes
	(a)		0.7, 0.4, 0.6 0.4	2	B2 for fully correct tree diagram (B1 for 0.7 or 0.4 in correct position)
	(b)		0.54	2	M1 for 0.3×0.4 or 0.7×0.6 A1 for 0.54 oe or ft their tree diagram

Q43. No Examiner's Report available for this question

Question	Working	Answer	Notes
		$(x-1)(x+4)$	M1 $(x\pm1)(x\pm4)$ A1 $(x-1)(x+4)$ oe

Q42. There were too many that lost the mark for the basic addition required in part (a). Even with the error in the table most then went on to score either part or full marks in part (b). The most common mistake in part (b) was not realising that 'greater than 12' does not include 12, but $\frac{7}{20}$ still gained one mark. The vast majority of responses were presented using correct probability notation, with very few 'out of' or ratios seen.

In part (c), the layout of many of the candidates working for this question was haphazard, with a minimal use of words to explain steps. In spite of this many scored full marks. The weaker candidates could not link the $\frac{2}{20}$ to a situation of 60 people, but most were able to get 1 mark for working out the income of £30. Although there were a number that worked backwards, making the mathematics fit, these rarely justified why 6 had won and so lost part of the marks for the question. There were a number that showed the profit from the non-winners only and loss of £1 to each of the winners, this was an alternative valid method and could if done correctly gain full marks.

Question		Working	Answer	Mark	Notes
	(a)		11 13 9 10 12 13 15 10 11 13 14 16	1	B1 table completed correctly
	(b)	$\frac{6}{20}$ or 0.3	$\frac{6}{20}$	2	M1 ft for $\frac{a}{20}$ $(a\neq6)$ and a<20 or $\frac{6}{b}$ $(b\neq20)$ and b>6 A1 ft for $\frac{6}{20}$ oe
	(c)		£21 with supporting calculations	4	M2 for $\frac{2}{20}\times60\times(1.50$ or $150)$ oe (M1 for $\frac{2}{20}\times60$ oe or $\frac{2}{20}\times1.50$ oe or $\frac{2}{20}\times150$ oe or 60×150 or 60×1.50 or sight of any of numbers (6, 15, 0.15, 9000, 90) M1 (income) 60×0.5 (=30) or 60×50 (=3000) A1 (Dep on at least 2 previous method marks) 21 cao

Q43. This question was done well by a good number of candidates, however there were also a surprising number of incorrect answers. A common error which lost a mark was in giving the coordinate without the brackets. A small number of candidates listed the values between 2 and 6, and from 3 to 8 and "found" the midpoint by crossing off matching values from each end of their lists. For the most part, this was done successfully. The most common incorrect approach observed was to subtract the two coordinates and this gave an answer of (4, 5). A few candidates attempted to complete this question by labelling the axes despite the diagram being labelled as not to scale.

Question		Working	Answer	Mark	Notes
			(4, 5½)	2	M1 for $\frac{2+6}{2}$ or $\frac{3+8}{2}$ or 4, 5½ without brackets A1 for (4, 5½) oe NB: (4,5) gets 0 without working

Q44. No Examiner's Report available for this question

Paper 1MA1: 2F			
Question	**Working**	**Answer**	**Notes**
		$p = qr - sr$	M1 for multiplying all 3 terms by r or isolating p/r term A1 oe

Q45. The ability to solve a pair of simultaneous equations was only demonstrated by the few more able students, although many did attempt it. Of those who did make a correct start by multiplying one equation with the intention of eliminating one of the unknowns, often the method was flawed by more than one error. A common error was to use the wrong operation when attempting to eliminate a variable.

Trial and improvement methods were very rarely successful.

Question	Working	Answer	Mark	Notes
		$x = 1.5, y = 3.5$	M1 M1 A1	for correct method to eliminate one variable (condone one arithmetic error) (dep) for substituting found value in one of the equations or correct method after starting again (condone one arithmetic error) for both $x = 1.5$ and $y = 3.5$

Q46. No Examiner's Report available for this question

Question		Working	Answer	Mark	Notes
			$x = 3, y = -2$	3	M1 correct process to eliminate one variable (condone one arithmetic error) M1 (dep) for substituting found value in one of the equations or appropriate method after starting again. A1 cao

Q47. Most candidates made good attempts at this final question. A small number of candidates scored one mark for getting at least one value in the table correct but then not plotting at least five of their points correctly. The most common error in completing the table was to write −5 instead of 5 for the value of *y* when *x* was −3.

Most candidates were able to plot their points from the table accurately to gain one mark in part (b). Many went on to draw a correct curve to gain the second mark and in some cases recovered from incorrect values in the table.

Around a third of the candidates scored all four marks with many of the candidates who scored three marks either failing to join their correctly plotted points or joining their points with straight lines.

Results Plus: Examiner Tip
Candidates should know that a quadratic expression gives rise to a parabola. In part (a), many calculated the *y*-value to be −5 when *x* was −3. This resulted in a curve that was clearly not a parabola. This should have alerted candidates to realise they had made an incorrect calculation.

		Working	Answer	Mark	Notes
	(a)		5, −4, −3	2	B2 for 5, −4 and −3 (B1 for 5 or −4 or −3)
	(b)		correct curve	2	B2 for fully correct curve (B1 ft for at least 5 points plotted correctly)

Q48.

The vast majority of candidates were able to draw the conversion graph in part (a) of this question and most used a ruler to draw the straight line. Some candidates failed to join (0, 0) to (15, 10) and were penalised for this. Of those candidates who failed to gain any marks in this part of the question, many drew vertical and horizontal lines but did not specify the points being plotted clearly, for example, by using a cross. A few candidates drew line graphs or bar charts.

It was encouraging to see so many correct answers to part (b) of the question despite the fact that the first part of the question asked the candidate to change £ to \$ rather than \$ to £. Candidates who drew lines across to or up to their conversion graph were less likely to make errors in reading from their graph. Over 80% of candidates scored at least 2 marks for their answers to this question.

Question		Working	Answer	Mark	Notes
	(a)		Graph drawn	2	B2 for a correct straight line from \$0 to \$60 (B1 for at least 4 points plotted accurately or line through at least 4 of the points from the table)
	(b)		37.50 33.33	2	B1 for value in the range 37 – 38 or ft from (a) (±1sq) B1 for value in the range 33 – 34 or ft from (a) (±1sq)

Q49.

In part (a), most candidates gained at least one mark giving at least 4 of the correct integers. There were some errors interpreting the difference between the inequality symbols with confusion as to whether -2 and 3 should be included. Some candidates appeared to have misunderstood the question and gave a final answer of 5 to indicate how many integers met the inequality. Candidate's answers for part (b) included both formal algebraic solutions and trial and improvement methods. Trial and improvement often yielded the correct integer answer from straightforward inspection whereas, many candidates who reached $^{11}/_{3}$ did not go on to give 4 as their final answer and so lost the final mark.

Question		Working	Answer	Mark	Notes
	(a)		–1, 0, 1, 2, 3	2	B2 for correct 5 values which may be in any order with no repeats (B1 four correct values and none incorrect or –2, –1, 0, 1, 2, 3)
	(b)	$3x > 11$ $x > {}^{11}/_{3}$ or 3.66.. OR (16 – 5) ÷3 $^{11}/_{3}$ or 3.66..	4	3	M1 $3x > 11$ or $3x > 16 - 5$ or $3x + 5 - 5 > 16 - 5$ A1 $^{11}/_{3}$ or 3.6(66..) or 3.7 (Accept = or ≥ in place of >) B1 ft OR M1 (16 – 5) ÷3 A1 $^{11}/_{3}$ or 3.6(66..) or 3.7 B1 ft

Q50.

There were some pleasing approaches to the solution of this problem. Successful candidates used properties of isosceles triangles to find the size of one of the base angles. If they got as far as this, the successful candidates invariably went to the angle PQR and solved the equation $2x + 13 = 58$ to get $x = 22.5$

Other approaches were tried but these were not successful as they were more algebraically complex.

The most common error was to say that the sum of the two base angles was 64 giving a starting point of $4(x-8) + 2x+13 = 64$

Question		Working	Answer	Mark	Notes
			22.5	4	M1 for $4(x-8) = 2x + 13$ M1 for expansion of bracket or division of all terms by 4, eg $4x - 32 = 2x + 13$, or $x - 8 = \frac{2x}{4} + \frac{13}{4}$ M1 for isolating x and number terms eg $2x = 45$, $\frac{x}{2} = \frac{45}{4}$ A1 for $\frac{45}{2}$ or 22.5 OR M1 for $(180 - 64) \div 2$ $(= 58)$ M1 for $4(x - 8) =$ "58" or $2x + 13 =$ "58" or "58" $- 13$ $(= 45)$ M1 for isolating x and number terms eg $4x = 90$, $2x = 45$ or "45" $\div 2$ A1 for $\frac{45}{2}$ or 22.5 OR M1 for $64 + 4(x - 8) + 2x + 13$ M1 for $64 + 4(x - 8) + 2x + 13 = 180$ M1 for isolating x and number terms eg $6x = 135$ A1 for $\frac{45}{2}$ or 22.5