Write your name here

Surname	Other names

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

Centre Number | | | | | |

Candidate Number | | | | |

Mathematics

Paper 2 (Calculator)

Foundation Tier

Mr Coren 'Practice Paper 'we haven't seen this stuff yet'

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 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.

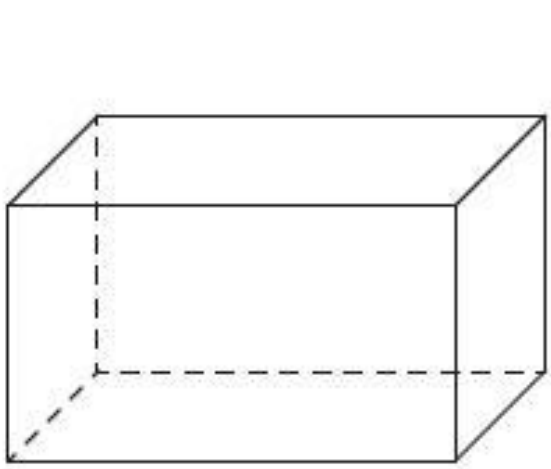
Turn over ▶

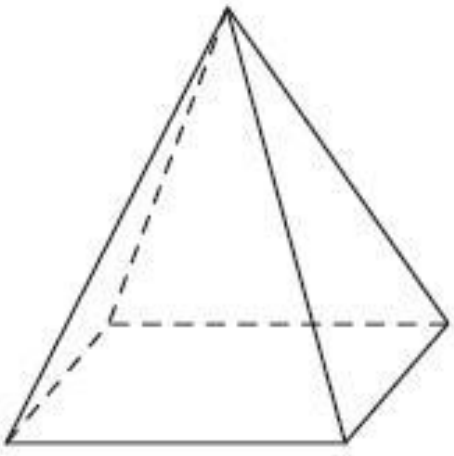
Q1.
Write down a 6 digit number that has 4 as its thousands digit.
You can only use the digit 4 once.

.....

(Total for question = 1 mark)

Q2. Write down the name of each of these 3-D shapes.

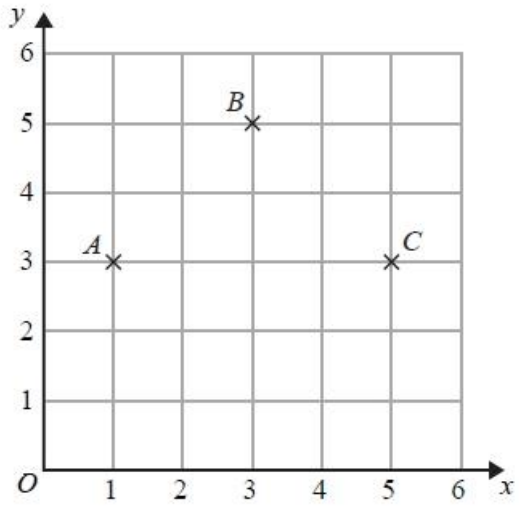




(i) . . . . . (ii) . . . . . .

(Total for Question is 2 marks)

Q3.



(a) Write down the coordinates of point *C*.

(..... , ...)

(1)

(b) Write down the coordinates of the midpoint of *AB*.

(..... , ...)

(1)

(c) On the grid, mark with a cross (×) the point *D* so that *ABCD* is a square.
Label this point *D*.

(1)

(Total for Question is 3 marks)

Q4. Write a number on the dotted line to make the statement correct.

2.75 litres = ... millilitres

(Total for question = 1 mark)

Q5.

At 5am the temperature was –5°C.
By midday, the temperature had risen by 7°C.
(a) Work out the temperature at midday.

..... °C **(1)**

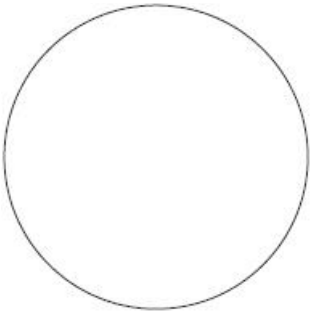
At 5pm the temperature was 9°C.
(b) Work out the difference between the temperature at 5am and the temperature at 5pm.

..... °C **(1)**

(Total for question = 2 marks)

Q6.

Draw a chord of this circle.



(Total for question = 1 mark)

Q7.

Here is the value of each of 20 coins.

50p	10p	£1	20p	£1
20p	£1	20p	50p	10p
50p	20p	20p	£1	20p
£1	£1	20p	20p	£1

(a) Complete the table.

Value of coin	Tally	Frequency
10p		
20p		
50p		
£1		

(3)

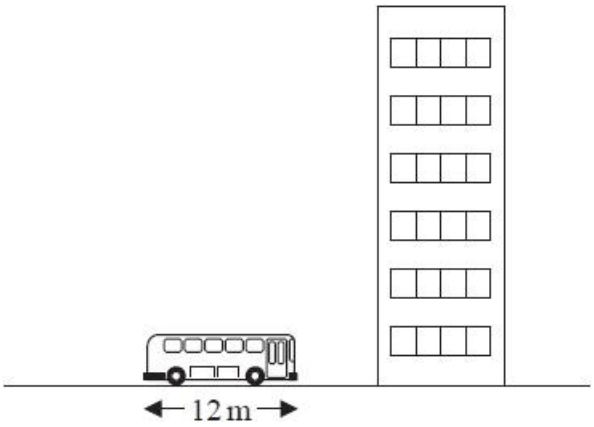
(b) Work out the total value of the 20 coins.

£. . . . . .

(2)

(Total for Question is 5 marks)

Q8.



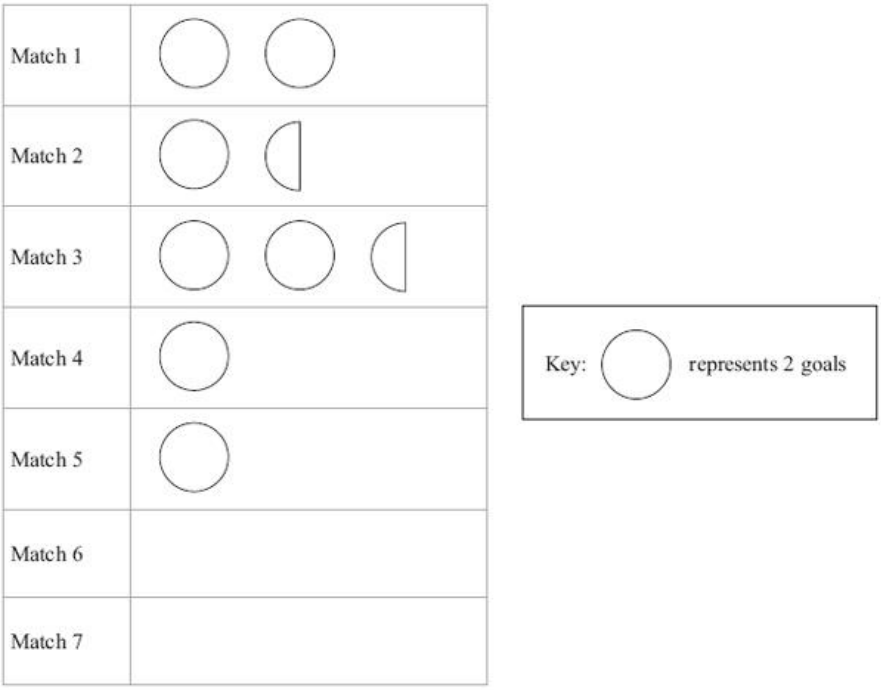
The picture shows a bus next to a building.
The bus has a length of 12 m.
The bus and the building are drawn to the same scale.
Work out an estimate for the height, in metres, of the building.

..... m

(Total for question = 2 marks)

Q9.

The pictogram shows the number of goals a hockey team scored in each of their first 5 matches.



(a) Write down the number of goals scored in Match 1

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

(b) Write down the number of goals scored in Match 3

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

6 goals were scored in Match 6 1 goal was scored in Match 7

(c) Show this information on the pictogram.

(2)

(Total for Question is 4 marks)

Q10.

Here is a list of 12 numbers.

12 15 18 12 15 12 16 13 17 15 12 17

(a) Write down the mode.

.....

(1)

(b) Work out the range.

.....

(2)

(c) Work out the median.

.....

(2)

(d) Work out the mean.

.....

(2)

(Total for question = 7 marks)

Q11.

Find the value of $(2.8 - 0.45)^2 + \sqrt[3]{5.832}$

.....

(Total for question = 2 marks)

Q12.

Here are the speeds, in kilometres per hour, of 15 cyclists.

16	22	34	18	24
22	33	28	19	41
23	25	31	40	23

Show this information in a stem and leaf diagram.

(Total for question = 3 marks)

Q13.

Here is part of an advert for a driving school.

> 8 out of 10 of the people we teach pass the driving test first time

Ali talked to 56 people who had been taught to drive by the driving school.
43 of these people passed the driving test first time.
Does this support what is said in the advert?
You must show how you get your answer.

(Total for question = 3 marks)

Q14. Here are two schemes for investing £2500 for 3 years.

Scheme A
gives £5.35 interest each month.

Scheme B
gives 3% simple interest each year.

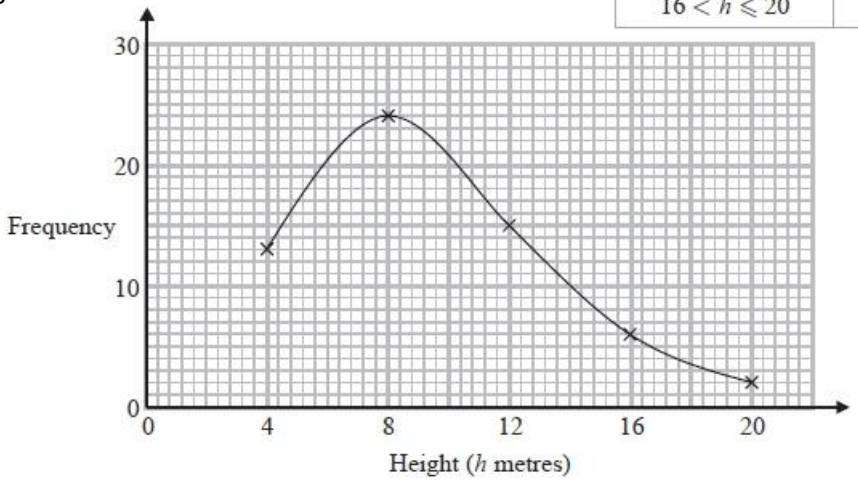
Which scheme gives the most total interest over the 3 year period?
You must show all your working.

(Total for Question is 4 marks)

Q15.
The table shows information about the heights of 60 trees.

Height (h metres)	Frequency
$0 < h \leqslant 4$	13
$4 < h \leqslant 8$	24
$8 < h \leqslant 12$	15
$12 < h \leqslant 16$	6
$16 < h \leqslant 20$	2

Jacob drew this frequency polygon for the information in the table.
The frequency polygon is **not** correct.



Write down **two** things that are wrong with the frequency polygon.

1 .....

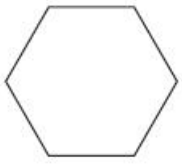
2 .....

(Total for question = 2 marks)

Q16. 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)

Q17.

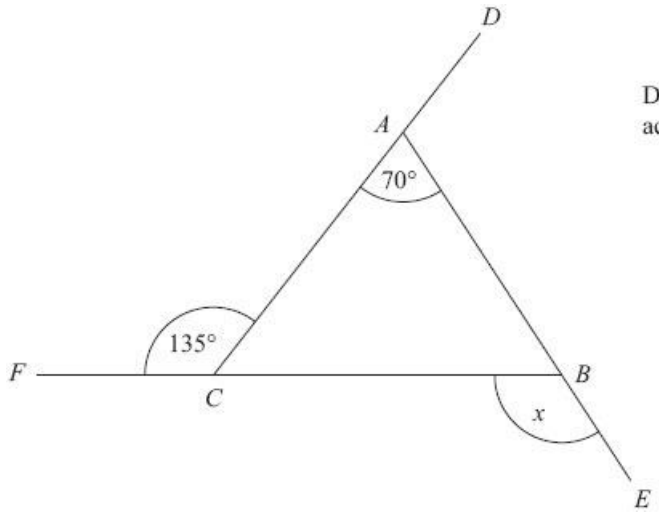


Diagram **NOT** accurately drawn

DAC, *FCB* and *ABE* are straight lines.
Work out the size of the angle marked *x*.
You must give reasons for your answer.

(Total for Question is 5 marks)

Q18.

$\frac{3}{8}$ of the people at a football match are men.

27% of the people at the match are women.

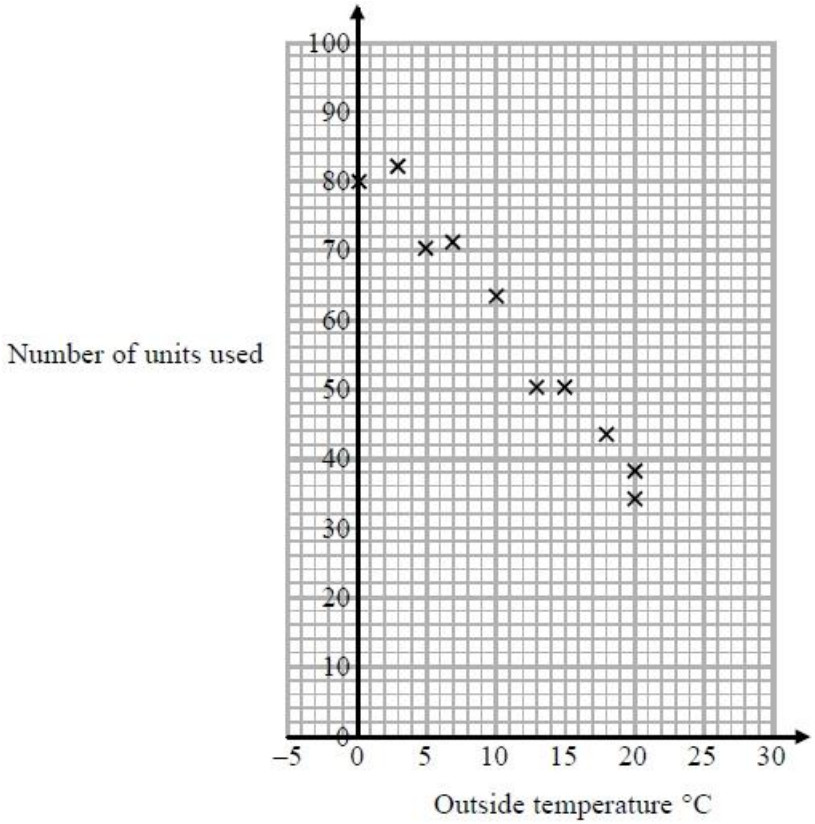
The rest of the people at the match are children.

Work out what percentage of the people at the match are children.

..... %

(Total for question = 3 marks)

Q19. In a survey, the outside temperature and the number of units of electricity used for heating were recorded for ten homes. The scatter diagram shows this information.



Molly says,

"On average the number of units of electricity used for heating decreases by 4 units for each °C increase in outside temperature."

(a) Is Molly right? Show how you get your answer.

.....

.....

(3)

(b) You should **not** use a line of best fit to predict the number of units of electricity used for heating when the outside temperature is 30°C.

Give one reason why.

.....

(1)

(Total for question = 4 marks)

Q20.

(a) Expand and simplify $3(y – 2) + 5(2y + 1)$

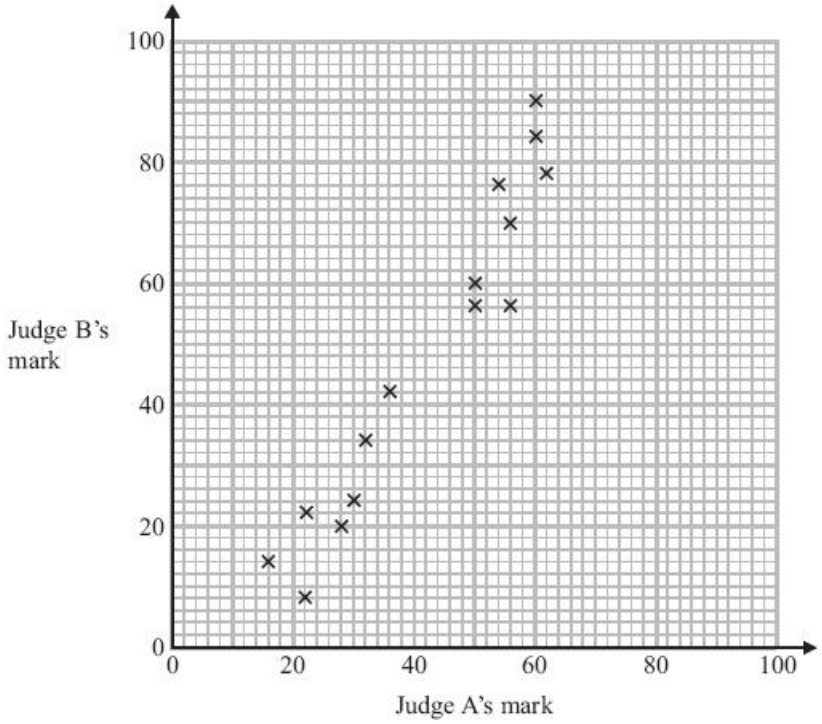
..... **(2)**

(b) Simplify $5u^2w^4 \times 7uw^3$

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

(Total for question = 4 marks)

Q21. Some children took part in a piano competition.
Each child was given a mark from Judge A and from Judge B.
The scatter graph below shows some of this information.



(a) Describe the correlation.

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

Judge A gives 44 marks to another child.

(b) Use the scatter graph to estimate Judge B's mark for this child.

.....marks **(2)**

(Total for Question is 3 marks)

Q22. Emma lives in Manchester.
She is planning to travel from Manchester to Blackpool.
The timetable shows information about the times of the trains Emma can catch from Manchester.

Manchester to Blackpool

Manchester	08 00	09 15	10 30
Bolton	08 20	09 30	10 57
Preston	08 45	09 55	11 25
Blackpool	09 30	10 40	11 52

Emma is going to meet her friend in Blackpool at 11 am.
(a) What is the time of the latest train she can catch?

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

(b) Work out the least time one of these trains takes from Manchester to Blackpool.

. . . . . minutes **(3)**

Emma and her friend spend ¾ hour having lunch.

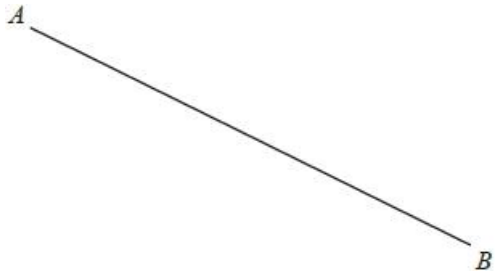
(c) Write ¾ hour in minutes.

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

(Total for Question is 5 marks)

Q23.

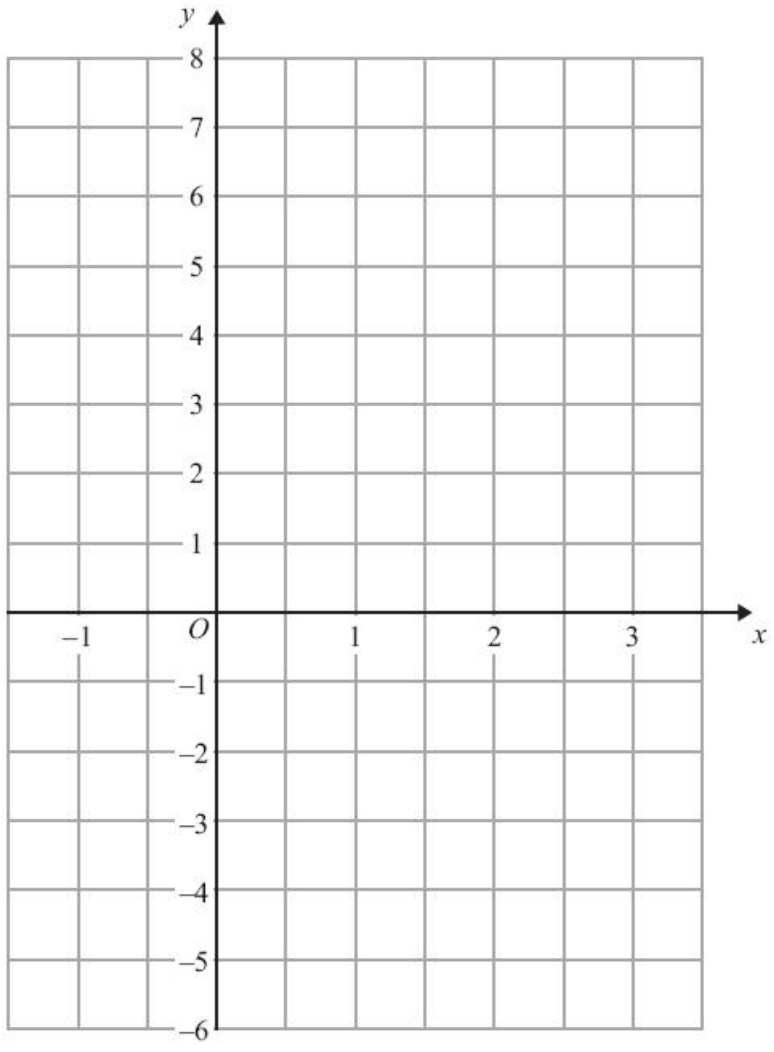
In the space below, use ruler and compasses to construct the perpendicular bisector of line *AB*.



(Total for question = 2 marks)

Q24.

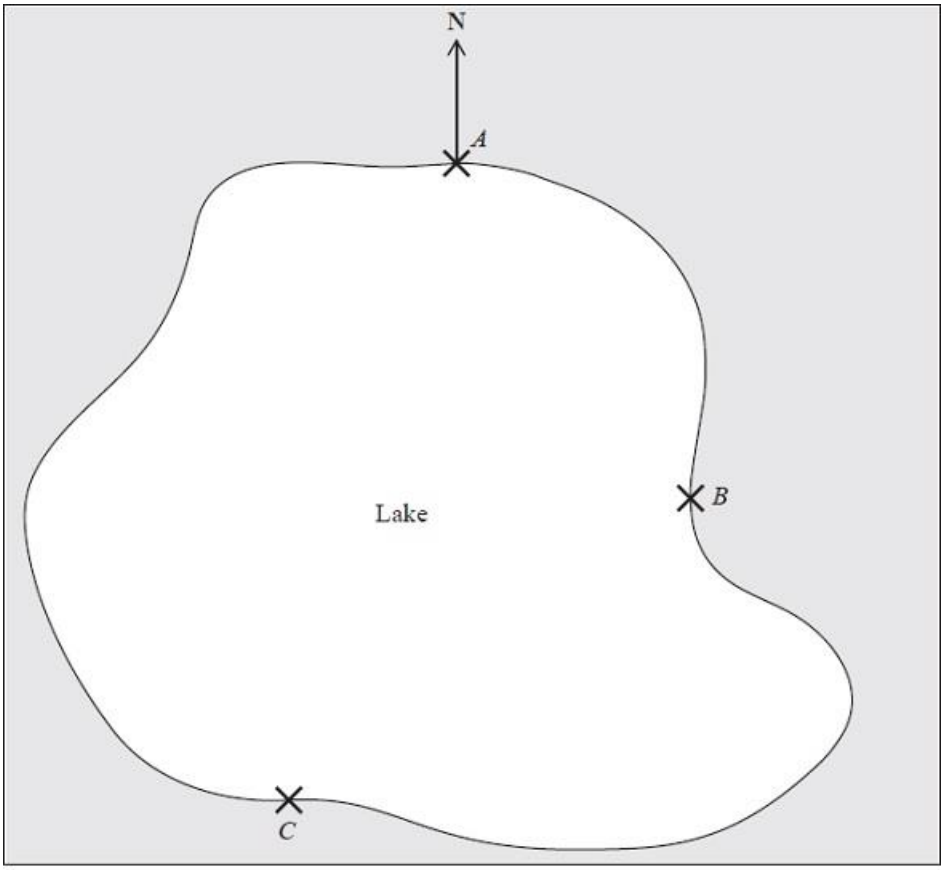
On the grid, draw the graph of $y = 3x - 2$ for values of x from –1 to 3



(Total for Question is 3 marks)

Q25.

The map shows the positions of three places *A*, *B* and *C* on the edge of a lake.



Scale 1 cm represents 2 km

(a) Find the bearing of *B* from *A*.

..... ° **(1)**

A ferry travels in a straight line from *A* to *B*.
It then travels in a straight line from *B* to *C*.

A speedboat travels in a straight line from *A* to *C*.

(b) How many more kilometres does the ferry travel than the speedboat?
You must show your working.

..... km **(4)**

(Total for Question is 5 marks)

Q26.

Bhavin buys a car in a sale.

Before the sale, the cost of the car was £6720

In the sale, the cost of every car is reduced by 20%.

Bhavin pays a deposit of £1500

He will pay the rest of the cost in 24 equal monthly payments.

Work out the amount of each monthly payment.

You must show all your working.

£ .....

(Total for question = 5 marks)

Q27.

Hayley is buying bottles of juice for a children's party.

She uses this rule to work out the number of bottles of juice she needs.

Number of bottles = Number of children ÷ 4 + 5

There will be 24 children at the party.

(a) Work out the number of bottles of juice Hayley needs.

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

Hayley needs 13 bottles of juice for a different children's party.

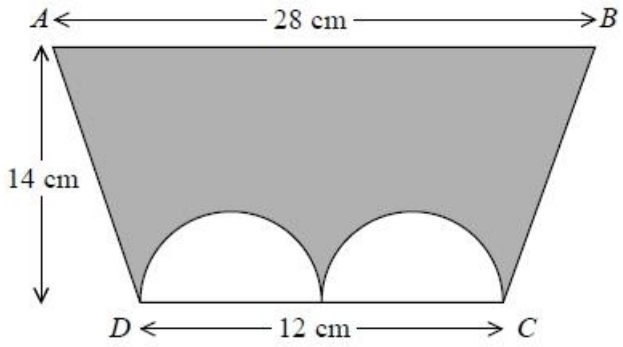
She used the same rule.

(b) Work out the number of children at this party.

. . . . . **(3)**

(Total for Question is 5 marks)

Q28. The diagram shows a trapezium *ABCD* and two identical semicircles.



The centre of each semicircle is on *DC*.

Work out the area of the shaded region.

Give your answer correct to 3 significant figures.

..... cm^2

(Total for question = 4 marks)

Q29.

(a) Find the value of the reciprocal of 1.6

Give your answer as a decimal.

.....

(1)

Jess rounds a number, *x*, to one decimal place.

The result is 9.8

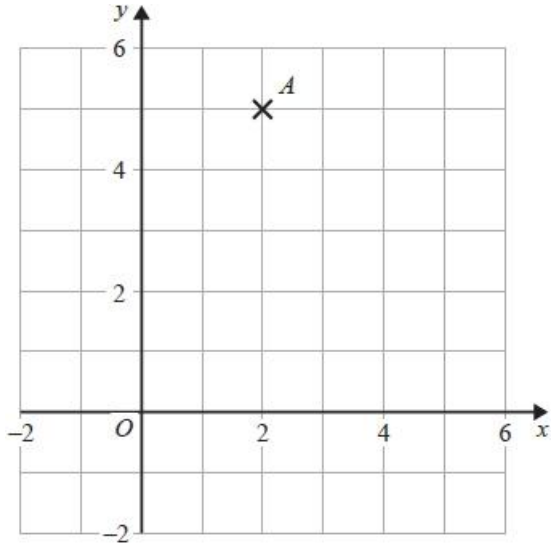
(b) Write down the error interval for *x*.

.....

(2)

(Total for question = 3 marks)

Q30. Find an equation of the straight line with gradient 3 that passes through point *A*.



.....

(Total for question = 2 marks)

Q31.

Dan, Harry and Regan sell cars.

Dan sells *x* cars.

Harry sells 5 more cars than Dan.

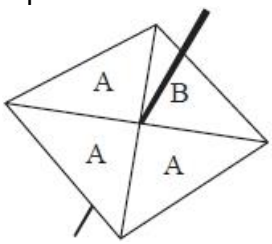
Regan sells twice as many cars as Dan.

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

.....

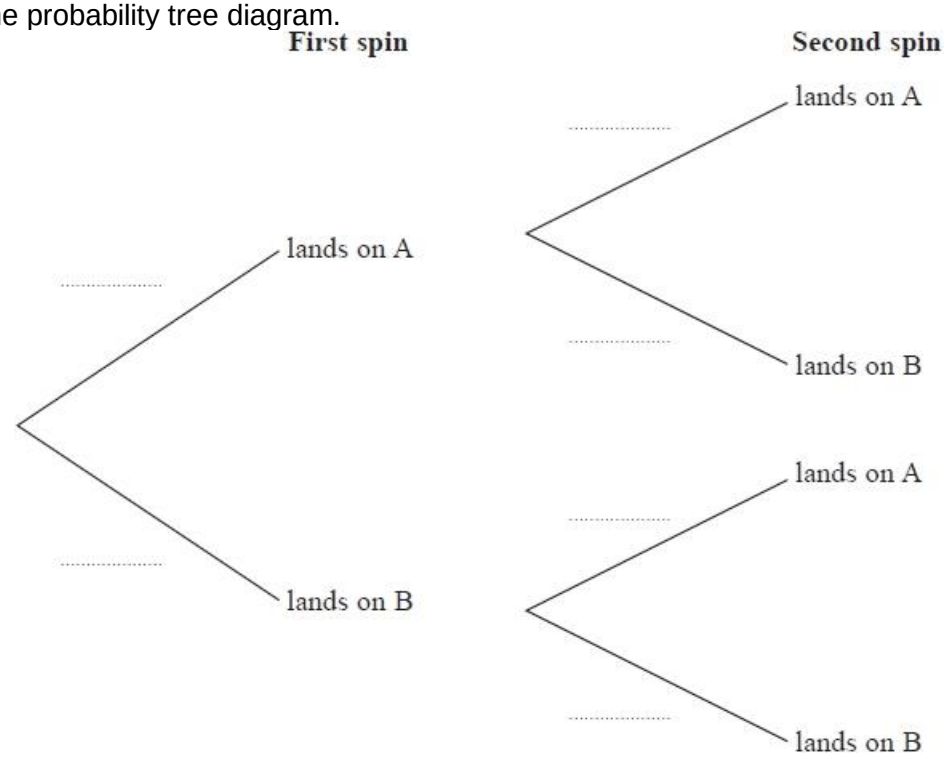
(Total for question = 2 marks)

Q32. The diagram shows a fair 4-sided spinner.



Hasmeet is going to spin the spinner twice.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that the spinner will land on A on the first spin and will land on B on the second spin.

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

(Total for question = 4 marks)

Q33.

Make h the subject of the formula $x = 5h + 8$

.....

(Total for Question is 2 marks)

Q34.

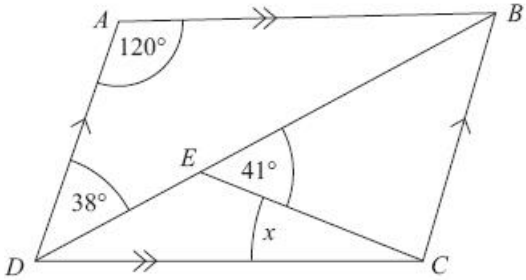


Diagram **NOT** accurately drawn

ABCD is a parallelogram.

Angle *ADB* = 38°.

Angle *BEC* = 41°.

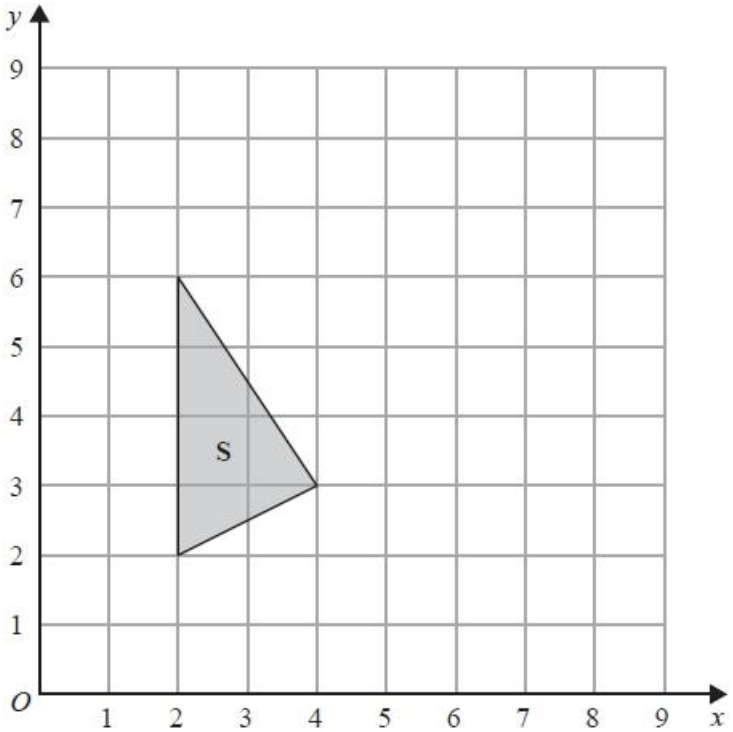
Angle *DAB* = 120°.

Calculate the size of angle *x.*

You must give reasons for your answer.

(Total for Question is 4 marks)

Q35.



(a) Rotate shape **S** 90° clockwise, centre (5, 4)
Label your image **T**.

(2)

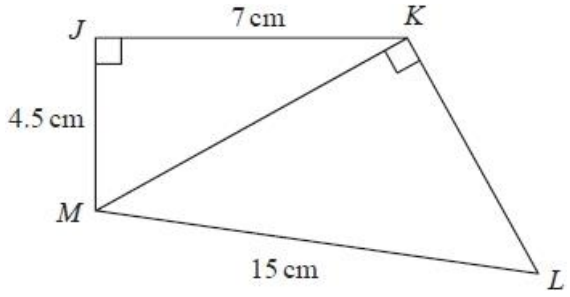
(b) Describe fully the single transformation that will map shape **T** onto shape **S**.

.....

(1)

(Total for question = 3 marks)

Q36. The diagram shows a quadrilateral *JKLM*.



Work out the size of angle *KLM*.
Give your answer correct to 3 significant figures.

..... °

(Total for question = 4 marks)

Q37.
Harley's house has a value of £160 000 correct to 2 significant figures.

(a) (i) Write down the least possible value of the house.

£ ..... **1)**

(ii) Write down the greatest possible value of the house.

£ ..... **(1)**

The value of Rita's house increased by 5%.
Her house then had a value of £210 000

(b) Work out the value of Rita's house before the increase.

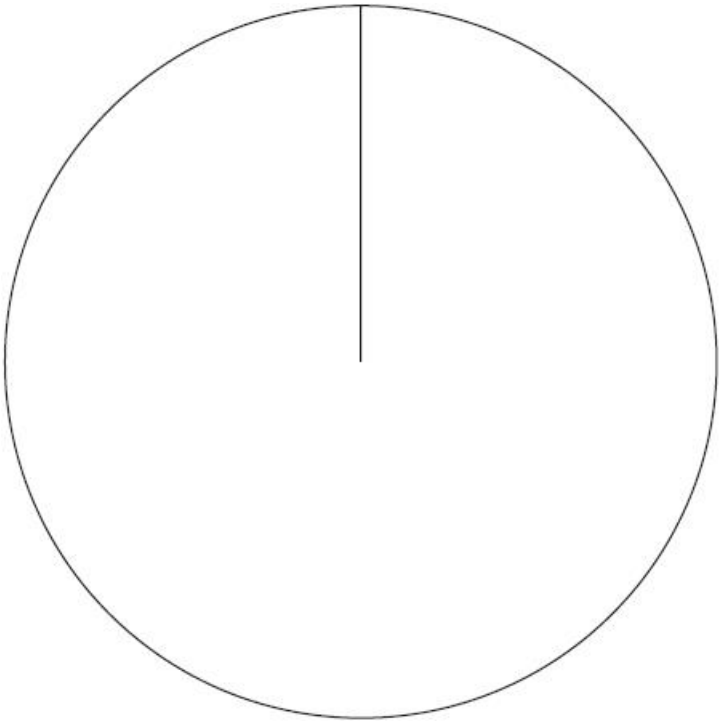
£ ..... **(2)**

(Total for question = 4 marks)

Q38. Sharon asked each of her friends to name their favourite Olympic sport.
The table shows information about their answers.

Sport	Frequency
athletics	13
cycling	17
swimming	8
gymnastics	7

Draw an accurate pie chart for this information.



(Total for question = 3 marks)

Q39. Here are the first four terms of a number sequence.

3 7 11 15

(a) (i) Write down the next term in the sequence.

.....

(ii) Explain how you got your answer.

.....

(2)

(b) Work out the 11th term in the sequence.

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

(c) Is 79 a term in this sequence?
Explain how you got your answer.

.....
.....

(1)

(Total for question = 4 marks)

Q40. Linda recorded the temperature, in °C, at 9 am on each of 30 days.

The table shows information about her results.

Temperature (T °C)	Number of days
$10 < T \leqslant 12$	3
$12 < T \leqslant 14$	8
$14 < T \leqslant 16$	14
$16 < T \leqslant 18$	4
$18 < T \leqslant 20$	1

Calculate an estimate for the mean temperature.

Give your answer correct to 1 decimal place.

..... °C

(Total for question = 3 marks)

Q41.

A is the point with coordinates (2, 10)

B is the point with coordinates (5, *d*)

The gradient of the line *AB* is 4

Work out the value of *d*.

d = ...

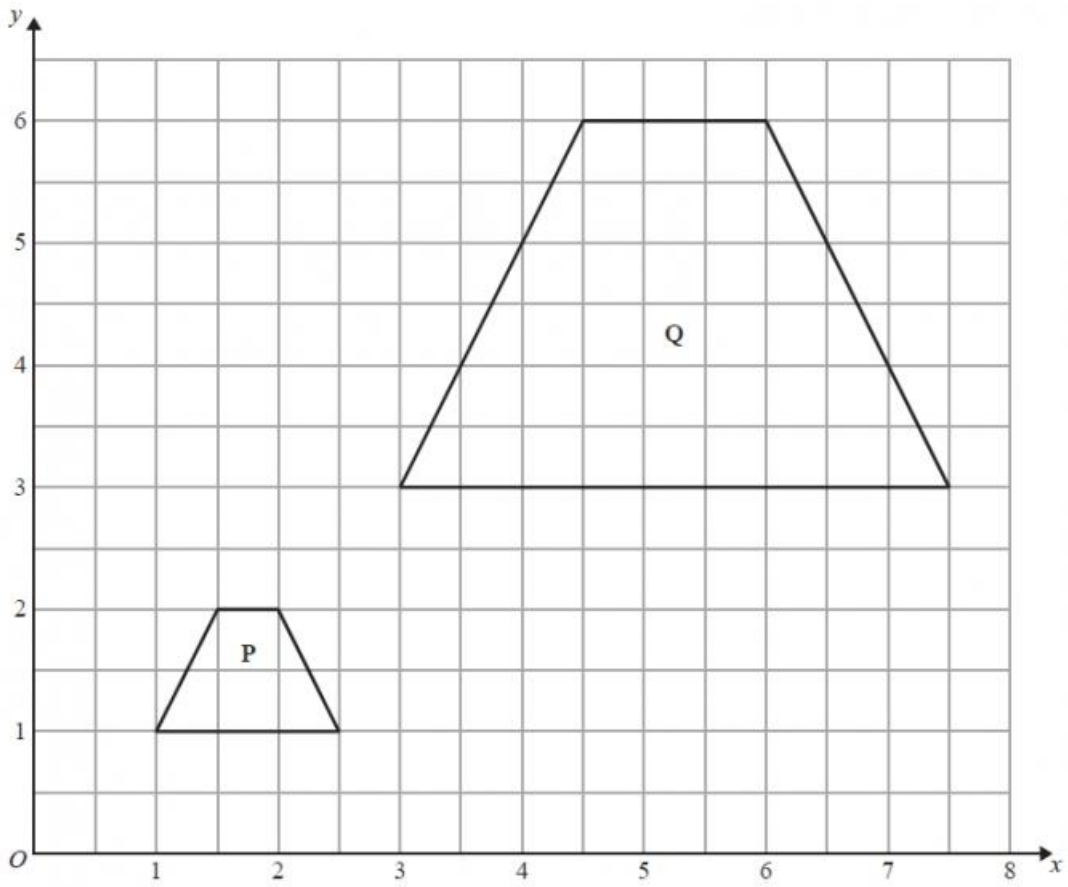
(Total for question = 3 marks)

Q42. Expand and simplify $5(p + 3) - 2(1 - 2p)$

.....

(Total for question = 2 marks)

Q43.



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

.....

.....

.....

(Total for Question is 3 marks)

Q44. The diagram shows two regular shapes.

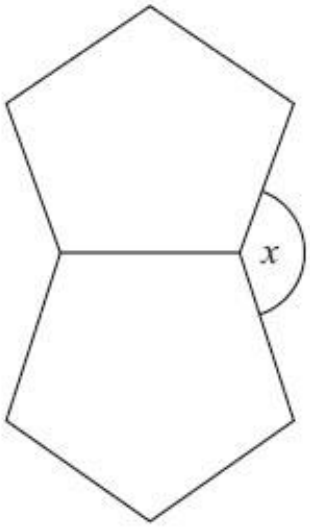


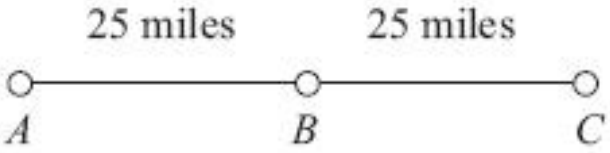
Diagram **NOT** accurately drawn

Work out the size of the angle marked *x*.

.....

(Total for Question is 3 marks)

Q45.



A, *B* and *C* are 3 service stations on a motorway.

AB = 25 miles

BC = 25 miles

Aysha drives along the motorway from *A* to *C.*

Aysha drives at an average speed of 50 mph from *A* to *B*.

She drives at an average speed of 60 mph from *B* to *C*.

Work out the difference in the time Aysha takes to drive from *A* to *B* and the time Aysha takes to drive from *B* to *C*.

Give your answer in minutes.

.....

(Total for Question is 3 marks)

Q46.

On a school trip the ratio of the number of teachers to the number of students is 1 : 15

The ratio of the number of male students to the number of female students is 7 : 5

Work out what percentage of all the people on the trip are female students.

Give your answer correct to the nearest whole number.

..... %

(Total for question = 3 marks)

Q47.

Here is a solid prism.

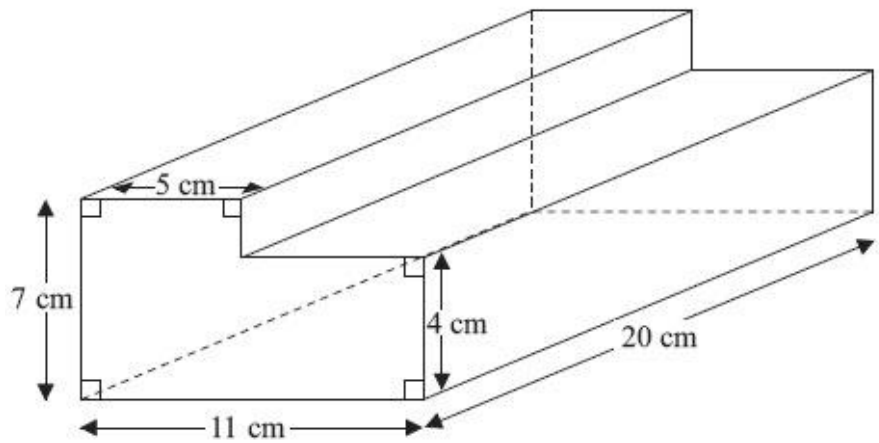


Diagram **NOT** accurately drawn

Work out the volume of the prism.

. . . . . cm^3

(Total for Question is 3 marks)

Q48.

$$\mathbf{a} = \begin{pmatrix} 1 \\ 4 \end{pmatrix} \text{ and } \mathbf{b} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$$

(a) Write down as a column vector

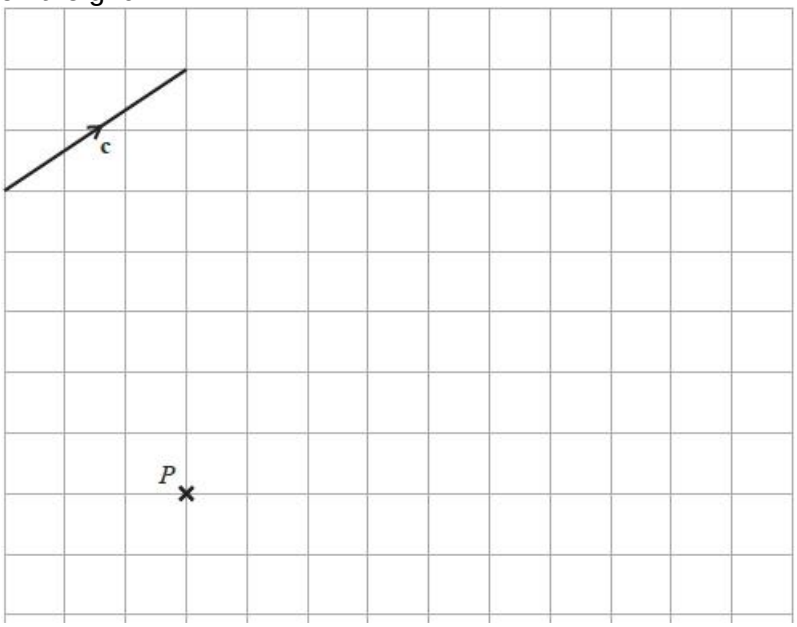
(i) **a** + **b**

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

(ii) 2**a** + 3**b**

.....
(2)

The vector **c** is drawn on the grid.



(b) From the point *P*, draw the vector 3**c**

(1)

(Total for question = 4 marks)

Q49.

Daniel bakes 420 cakes.

He bakes only vanilla cakes, banana cakes, lemon cakes and chocolate cakes.

$\frac{2}{7}$ of the cakes are vanilla cakes.

35% of the cakes are banana cakes.

The ratio of the number of lemon cakes to the number of chocolate cakes is 4:5

Work out the number of lemon cakes Daniel bakes.

.....

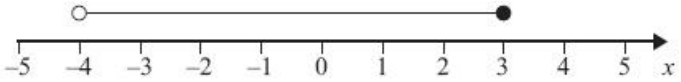
(Total for question = 5 marks)

Q50.

(a) n is an integer. $-1 \leq n < 4$ List the possible values of n.

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

(b)



Write down the inequality shown in the diagram.

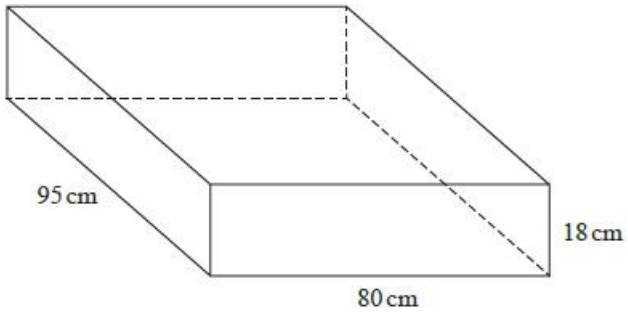
..... **(2)**

(c) Solve $3y - 2 > 5$

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

(Total for Question is 6 marks)

Q51. A sofa has 6 identical cushions.
Each cushion is a cuboid 18 cm by 80 cm by 95 cm.



The cushions are covered with a protective spray.
The protective spray is in cans.
The label on each can has this information.

Spray in this can covers 4 m^2

(a) Work out how many cans are needed to cover the 6 cushions with protective spray.

..... **(5)**

The information on each label is inaccurate.
The spray in each can covers 10% more than 4 m^2.

(b) How will this affect the number of cans needed for the 6 cushions?
You must show how you get your answer.

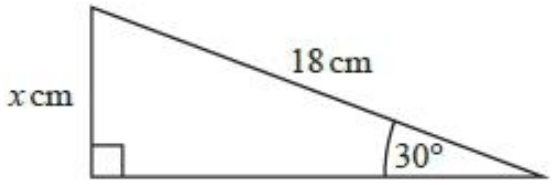
.....

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

(Total for question = 7 marks)

Q52.

Work out the value of x.



.....

(Total for question = 2 marks)

Q53.

The diagram shows a container used to store oil.

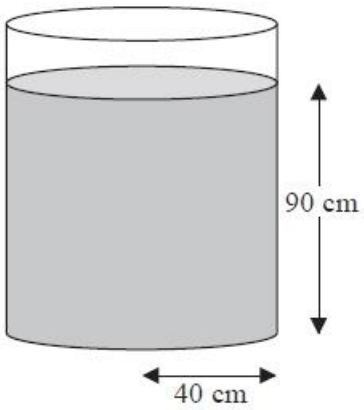


Diagram **NOT** accurately drawn

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)

Q54. Solve the simultaneous equations

$$2x + 3y = 10$$
$$4x - y = -1$$

x = ...

y = ...

(Total for question = 3 marks)

Q55.

$\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{\text{multiples of } 2\}$
$A \cap B = \{2, 6\}$
$A \cup B = \{1, 2, 3, 4, 6, 8, 9, 10\}$

Draw a Venn diagram for this information.

(Total for question is 4 marks)

Q56.

(a) Factorise $x^2 - 169$

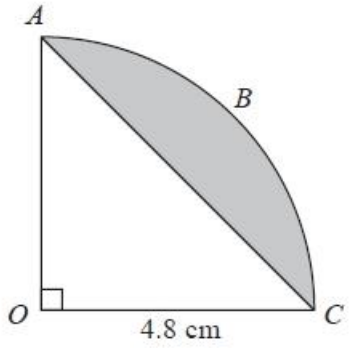
..... **(1)**

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

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

(Total for question = 3 marks)

Q57.



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)

Q58.

Solve $x^2 + 5x - 24 = 0$

.....

(Total for question = 3 marks)

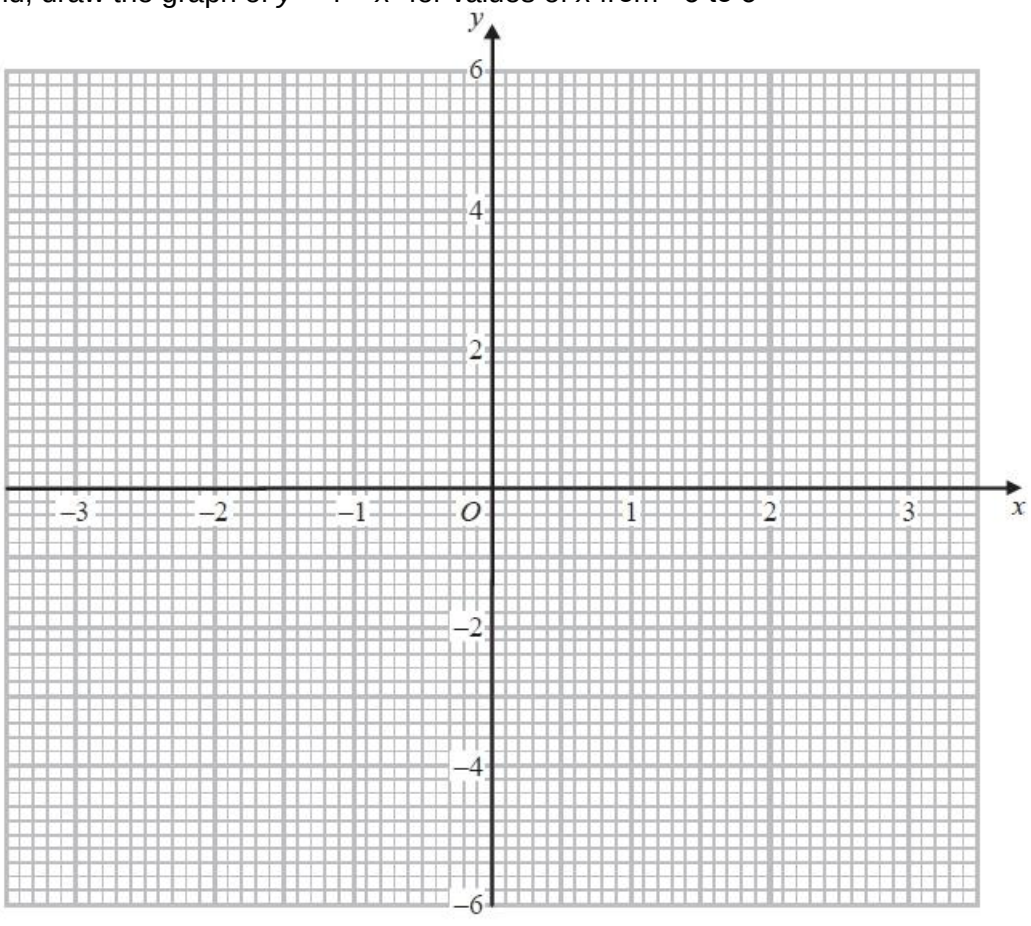
Q59.

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

x	−3	−2	−1	0	1	2	3
y	−5		3			0	

(2)

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



(2)

(Total for question = 4 marks)

Q60.

In a sale normal prices are reduced by 20%.

A washing machine has a sale price of £464

By how much money is the normal price of the washing machine reduced?

£ .....

(Total for Question is 3 marks)

Examiner's Report

Q1.
Whilst the majority of students gave a correct answer there were a good number of incorrect responses; a few used numbers such as 4327.23 which was acceptable. However, those students that were incorrect often used fewer than 6 digits or occasionally more than one 4 in the answer. It is worth centres asking students to be careful with the placement of commas and decimal points as some were very difficult to decipher.

Q2.
Candidates found a variety of names for these two 3-D shapes apart from the correct ones. In part (i) there were a lot of rectangles mentioned and on part (b) many prisms, triangles and triangular pyramids. Incorrect spelling was accepted provided the meaning was clear.

Q3.
All parts of this question were accurately answered by most students with just a few instances of the reversal of x and y coordinates, most commonly in part (b). Students appeared to find the concept of a mid-point very familiar although a few found (3, 3), the mid-point of AC. The vast majority had no difficulty finding the missing vertex of a square.

Q4.
No Examiner's Report available for this question

Q5.
There were many correct answers here. Predictably incorrect answers included −12 in part (a) and 4 for part (b).

Q6.
No Examiner's Report available for this question

Q7.
Most candidates displayed a good understanding of this question. They were able show the correct tally of the number of coins and their corresponding frequencies. Some errors noted include cases where in part (a) some students wrote the total value of each type of coin instead of their frequencies and in part (b) some students simply gave the total number of coins i.e. 20 as the total value of the coins. Some also added each type of coin i.e. 10+20+50+1.00 giving their final answer as £1.80. However, the most common error was in part (b) where many candidates assumed that 'work out the total value of the 20 coins' meant 'find the total value of the 20p coins' thus giving an answer of £1.60.
In this question, correct money notation was required for award of the final mark. Hence neither £30.1 with omission of the final zero nor incorrect use of a colon in £10:30 were acceptable.

Q8.
30m was the modal correct answer for this question, where the height of the building was estimated at two and a half bus lengths.
Many students however used the height of the bus for comparison with the height of the building and made many errors. It was not enough for the award of the method mark to simply say that there were about 6 to 7 bus heights equivalent to the height of the building. Students had first to make a sensible comparison between the length of the bus and its height, possibly using the scale of 2cm = 12m.

Q9.
Most candidates were able to demonstrate a good understanding of pictograms. Part (a) was answered extremely well with candidates using the key correctly to find the number of goals.
Almost as many candidates gave the correct number of goals in part (b).
Part (c) was also answered very well with the majority of candidates completing the pictogram correctly. The most common error was showing seven goals, rather than one goal, for Match 7.

Q10.
In part (a), the mode was well understood.
Part (b) was answered very well with most students able to find the range correctly. Incorrect answers were often the result of students using 17, not 18, as the highest value.
In part (c), the majority of students knew that the median was the middle number even if they tried to find the median without ordering the list. Most students did order the numbers with many then able to give the correct answer. A common error was to identify the two middle numbers as 15 and then give 15.5 as the answer.
In part (d), the majority of students knew how to work out the mean. Errors included keying into a calculator so that only the final value was divided by 12 or adding up the numbers but arriving at an incorrect total. Some students lost the opportunity of gaining a method mark because they showed insufficient working. Those who wrote 159 ÷ 12, for example, could only be awarded a method mark if it could be seen that 159 had come from an attempt to add up the numbers.
Errors in this question were often the result of students confusing the averages, eg giving the mode for the median and vice versa or giving the mean for the median.

Q11, to 13 No Examiner's Report available for this question

Q14.
It was pleasing to note that over 40% of candidates scored all four marks. Many of those candidates who scored no marks were able to calculate the value of 192.6 or 2692.6 for scheme A, but then failed to negotiate the percentage element of scheme B. Many candidates used a chunking method to find 3% of 2500, mostly with success. Some candidates used a compound interest method correctly and some gained two marks as they then correctly compared both schemes using the same time scale. One common error was for candidates to add £5.35 and 2500, then multiplying this by 36.

Q15. No Examiner's Report available for this question

Q16.
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.

Q17.
This question had a mixed response. The most popular approach was to calculate the internal angles of the triangle.
A significant number of candidates thought that the triangle was isosceles (some thought that it was equilateral). A common incorrect approach here was to either calculate the angle *ACB* correctly as 45 degrees and then state the angle *ABC* as 45 degrees or to calculate both the angles *ACB* and *ABC* (ie the 'base angles') as 55 degrees.
Few candidates were able to state the reasons for their calculations correctly, often omitting to use the word angle, eg 'the triangle is 180 degrees'.
Candidates should be advised to state the reasons for their calculations with the calculation, not at the end when it is unclear which calculation is being justified by the reason.
Most candidates were able to identify their calculations clearly with the angles by simply labelling the diagram, but candidates not using this approach should be advised to use a suitable unambiguous notation, eg labelling the internal angles *a* and *b*, to identify the angles. Most candidates gave their final answer in the form x = …

Q18 to 20 No Examiner's Report available for this question

Q21.
Part (a) was generally well answered.
There were problems for candidates with part (b) because the scale on the Judge A axis went up in 2s so many looked above 48 rather than 44. The practice of looking at the two values nearest the gap and halving the two values was seen more often.
This usually leads to an acceptable answer. Here it led to (42 + 56) ÷ 2 giving 49. However, many candidates could not read the judge B scale correctly as it went up in 2s also. In many cases answers were given just outside the accepted tolerance but were awarded no marks as there was no supporting work on the scatter diagram.

Q22.
Candidates sometimes misread part (a), giving the arrival time of their train rather than the departure time. Most were able to pick the correct train.
In part (b) some made an incorrect assumption that they all took the same time, and only worked out the time for the first train. Poor performance was seen from those candidates who attempted to work out the three separate durations for each train; more successful were those who worked out the duration using the departure and arrival times only. Clear working out facilitated the award of method marks. Far too many candidates lost a mark in not presenting their answer using correct notation. Though the answer line stated "minutes", answers shown as 1 hour 22 minutes were accepted for full marks. But too many candidates wrote answers such as 122 (minutes), 1:22, 1.22, etc., completely oblivious to the need to differentiate between the 1 and the 22 in terms of time units.
There were also far too many incorrect answers given in part (c), with many misreading the question as a requirement to write ¾ as a decimal (0.75).

Q23.
No Examiner's Report available for this question

Q24.
Many candidates were unaware of the idea of an algebraic graph and thus did not attempt the question. Of the remainder, some knew that the answer was a straight line, but often joined the points (-1, 3) and (3, -2), presumably focussing on the numbers given in the equation and in the range of values of x. Of course, many knew that they had to work out a set of values of y and used sensible integer values of x. Of these that did this, some candidates made an error on the value of y when $x = -1$. Surprisingly, there were many cases of correct values of y being found but a really incorrect set of points being plotted - often in a vertical line. There were some cases of 5 points being plotted correctly but not joined up.

Q25.
Candidates often struggle with bearings and this year was no exception with candidates being unsure of which angle to measure. Part (b) was tackled well with most candidates measuring at least one of the distances correctly in cm and then converting this correctly to km scoring at least 2 marks. Many then went on to produce a final answer between 7 and 9 from correctly measuring all 3 distances.

Q26.
Many candidates could not reduce the cost of the car by 20%. They either ignored the 20% or worked out 6720 − 20 or even 6720 − 0.20. They could still get the next two marks for subtracting 1500 and then dividing by 24. However, some missed the subtracting 1500 part and gained no marks.
It was not unusual to see a candidate work out 20% of £6720 correctly to get the answer £1344 and then follow it with £1500 − £1344 followed by the division by 24
A number of candidates successfully arrived at £3876 but then divided by 12 rather than 24

Q27.
This question was a good discriminator with part (a) being well done by most candidates and part (b) providing more of a challenge. Over 80% of candidates were successful in gaining both marks in part (a) and 50% of candidates gained all 3 marks in part (b). In the second part some candidates failed to realise that the question was testing inverse operations and substituted 13 for the number of children. Other candidates were able to identify the inverse operations needed but applied them in the wrong order. Many candidates used a trial and improvement method. Sometimes candidates could have avoided a loss of marks by checking that they had put the correct number on the answer line. For example "13 = 32 ÷ 4 + 5" was often seen in the working space but sometimes the answer "13" was then written on the answer line.

Q28.
No Examiner's Report available for this question

Q29.
In part (a), those students understanding the meaning of 'reciprocal' usually found the correct answer. Very many students did not. Fewer numbers of students understood the term 'error interval' in part (b). Some scored 1 mark for quoting either 9.75 or 9.85. Those few giving inequalities with the correct limits often made mistakes with the actual inequality signs chosen.

Q30.
No Examiner's Report available for this question

Q31.
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.

Q32. No Examiner's Report available for this question

Q33.
Students had little success with changing the subject of this formula with a few managing the first step, invariably to subtract 8 from both sides. Errors with algebraic manipulation were common with addition of 8 or even subtraction of 5 from both sides seen.

Q34.
This question discriminated well between the more able candidates taking this paper. More than 40% of candidates were able to work out the size of at least one of the missing angles (candidates were given credit for these written clearly on the diagram). About a half of these candidates made further progress and worked out the size of several angles but only the more able candidates were able to get as far as finding the size of angle x. Very few candidates gave correct reasons in an acceptable form and so candidates could rarely be awarded all four marks for their response. In particular, candidates did not accurately articulate properties involving angles and parallel lines. Weak candidates often added the sizes of the angles given on the diagram and then found the difference between their answer and 180° or 360°.

Q35 & 36. No Examiner's Report available for this question

Q37.

Part (a) was not answered very well. Students were more successful at writing down the least possible value of the house than the greatest possible value of the house. A variety of incorrect answers were seen. These included 159 000 and 159 999 in part (a)(i) and 164 000 and 169 999 in part (a)(ii).
Students who recognised that 210 000 = 105% in part (b) not only gained the first mark but usually went on to get the correct answer. Not surprisingly, the most common mistake was to work out 5% of 210 000 and then subtract the result from 210 000 or, less frequently, to add it to 210 000.

Q38.
No Examiner's Report available for this question

Q39.
The vast majority of students were able to write down the next term in the sequence in part (a) and most could explain how they got their answer.
In part (b), most students gave 43 as the 11th term in the sequence. Incorrect answers were usually due to arithmetic errors.
Although part (c) was answered less well, some very good explanations were seen. Some students stated that it is the 20th term; some said that 79 is in the sequence because 19, 39 and 59 are in the sequence and some continued the sequence up to 79. However, many explanations were insufficient. Some students stated, for example, that 79 is in the sequence because it is an odd number and all the terms in the sequence are odd or wrote "I kept adding 4", without providing any evidence that this did result in 79 being in the sequence.

Q40 and 41. No Examiner's Report available for this question

Q42.
This question provided the challenge of multiplying the terms in a single bracket by a negative value; this was a step too far for many students. Most students were successful in expanding the first bracket to gain 1 mark but then spoiled further work by unsuccessfully multiplying through the second bracket and either missed the required bracket after multiplying by 2 or wrote the incorrect sign for the final term. Other students spoiled further work by failing to simplify terms correctly or went on to add all the terms together numerically.

Q43.
Over one third of students recognised the transformation as an enlargment 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 enlargment. Typically, a translation was described or vector given.

Q44.
This question was very poorly attempted with around three-quarters failing to score. Candidates commonly mixed the methods for finding interior and exterior angles, and only about a fifth of candidates actually arrived at the answer 144 from fully correct working. A very common incorrect answer was 216, where candidates had found each interior angle to be 360 ÷ 5 = 72, doubled 72 to get a sum of 144 and then subtracted this from 360, giving an answer 216.

Q45.
This question was not well done. Less than 1 in 10 candidates scored full marks with a further 2 in 10 candidates scoring part marks. The most successful candidates used a common sense approach realising that at an average speed of 50 mph Aysha would cover a distance of 25 miles in half an hour and that for the second part of the journey, a speed of 60 mph is equivalent to an average of 1 mile per minute.
A significant proportion of candidates earned the mark available for the time it took Aysha to drive from A to B, the first part of her journey. Fewer candidates obtained the correct time for the second part of the journey. Many of them gave the time taken to travel from B to C as 24 minutes. Evidence seen suggested that these candidates had worked out 60 ÷ 25 (=2.4) and interpreted their answer as 24 minutes. Many of these candidates went on to work out "30 – 24" and so earned a second mark for working out the difference of their times (with at least one correct).
Another error commonly seen was for candidates to divide speed by distance getting answers of 2 and 2.4 and then interpreting the difference as 40 minutes. Candidates often made errors converting between units of time and some weaker candidates either multiplied the speed by the distance for each part of the journey or simply found the difference between the two speeds giving their answer as "10".

Q46. No Examiner's Report available for this question

Q47.
Few candidates were able to find the correct volume of this prism. Many attempted to find the surface area and many tried to find the volume by multiplying the perimeter of the cross section by the length of 20 cm. A significant number did start by finding the volume of one cuboid, usually 1540 (11 × 7 × 20) but failed to complete the task. Among the candidates who attempted to find the area of the cross section, errors included the use of incorrect dimensions (not usually shown on the diagram) or working such as (11 × 4) + (7 × 5).

Q48. No Examiner's Report available for this question

Q49.
A very well answered question with the vast majority of students scoring full marks.
The most common method used was to calculate using the fraction and then the 35%. These students then correctly subtracted and split the remaining number of cakes in the given ratio of 4 : 5. The most popular alternative approach used was to convert the fraction into a percentage. Accuracy was sometimes lost through premature rounding with this method. Centres are advised to encourage students to calculate with fractions.

Another alternative approach was to add the $\frac{2}{7}$ and the 35% together, either in percentage or fraction form, to then work out the remainder as a percentage/fraction of 420 and then split into the correct ratio. Again some inaccuracies through rounding were seen if the percentage approach was used.

The most common mistake seen was to find $\frac{2}{7}$ of 420 as 120 then to do 420 − 120 = 300 and then to find 35% of this, rather than the original amount of 420. A student who did this could still score 3 marks, not gaining the process mark for finding the correct percentage or the correct fractional value and then going on to subtract these values from 420.
It was pleasing to see the number of students who successfully used ratio at the end of this problem.
This question was accessible to all students.

Q50.

Over half of the candidates scored at least one mark for their responses to parts (a) and (b) of this question which tested an understanding of the notation and diagrams used to illustrate inequalities. About 1 in 20 candidates scored all four marks.

In part (a) most candidates did not interpret the "≤" and "<" signs correctly and either did not include "-1" in their list of integers and/ or did include "4".

There were few totally correct answers to part (b) of the question. It was common to see "-4 ≤ 3" or "-4 < 3". These answers could not be awarded any marks. Of those candidates who could be awarded partial credit, many gave an answer in the form ""-4 ≤ x < 3" showing an incorrect understanding of the notation using empty and full circles. Many candidates gave the range of the two endpoints, "7", as their answer.

In part (c) of this question, candidates rarely tackled the inequality with confidence. Of those candidates who did show some correct working, many either spoilt their answer by rounding $7/3$ to 2.3 or treated the question as one with an equation rather than an inequality. These candidates could not, of course, be awarded full marks but often could be awarded 1 mark.

Q51 and 52.

No Examiner's Report available for this question

Q53.

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.

Q54 to Q57.

No Examiner's Report available for this question

Q58.

The method of solving simple quadratic equations by factorisation, a standard process, is now part of the Foundation level specification and should be accessible to the more able students taking this paper. A fully correct solution was rarely seen and attempts to factorise $x^2 + 5x - 24$ were seldom seen. Instead, much fruitless and incorrect algebra involving the manipulation and often combination of one or more of the three terms of the quadratic expression was common. A trial and improvement approach was common and often led to students obtaining one of the solutions (3) but not the other (−8). Students obtaining only one of the two solutions were not awarded any marks unless they had made a creditable attempt to factorise the expression.

Q59.

Many gained full marks on this question, even though the quadratic was a "take from". There were some errors in calculating the numbers for the table, but the main error was in drawing the graph as a series of line segments, rather than as a curve.

Q60.

The most common mistake was calculating 20% of 464 (=92.8) and then having variations of 464 ±92.8 Of those who correctly recognised that 464 was 80% on original price many incorrectly gave 580 as the final answer, even though many had correctly already calculated 116 as the reduction.

Mark Scheme

Q1.

Question	Answer	Mark	Mark scheme	Additional guidance
	Suitable number eg. 564 000	B1	for a suitable 6 digit number with 4 as thousands digit	Can be a decimal eg 4652.99, 4625.90

Q2.

Question		Working	Answer	Mark	Notes
	(i)		Cuboid	2	B1 for cuboid or (rectangular) prism
	(ii)		Pyramid		B1 for pyramid, rectangular base pyramid, square base pyramid

Q3.

PAPER: 1MA0_2F					
Question		Working	Answer	Mark	Notes
	(a)		5, 3	1	B1 cao
	(b)		2, 4	1	B1 cao
	(c)		Point marked	1	B1 cao

Q4.

Question	Working	Answer	Mark	Notes
		2750	B1	cao

Q5.

PAPER: 1MA0/2F				
Question	Working	Answer	Mark	Notes
(a)		2	1	B1 cao
(b)		14	1	B1 Accept −14

Q6.

Question		Working	Answer	Mark	Notes
			Chord drawn	1	B1

Q7.

Question	Working	Answer	Mark	Notes
(a)		10p || 2 20p 8 50p 3 £1 7 10.30	3	B3 for a fully correct table showing all tallies and frequencies (B2 for 2 or 3 correct tally and related frequency entries or for 4 correct tallies or for 4 correct frequency totals) (B1 for 1 correct tally or 1 correct frequency)
(b)	10 × 2 + 20 × 8 + 50 × 3 + 100 × 7 20 + 160 + 150 + 700		2	M1 for 10 × "2" or 20 × "8" or 160 or 1.6(0) or 50 × "3" or 150 or 1.50 or 100 × "7" or 700 or evidence of adding all 20 original coin values A1 ft from table shown using correct money notation.

Q8.

Question	Working	Answer	Mark	Notes
		30	M1	for 12 m = 1.9 to 2 cm or for a scale factor of 2.25 to 2.75 (comparing length of bus with height of the building) or a **complete** method using the height of the bus to compare with the height of the building.
			A1	answer in range 27 to 33

Q9.

		Working	Answer	Mark	Notes
	(a)		4	1	B1 cao
	(b)		5	1	B1 cao
	(c)			2	B1 cao for Match 6 B1 cao for Match 7

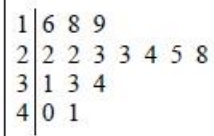
Q10.

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
(a)		12	1	B1 cao
(b)		6	2	M1 for 18 –12 or 12 –18 or 12 to 18 A1 cao
(c)		15	2	M1 for listing the numbers in order or identifying the middle two numbers as 15 or an answer of 14 A1 cao
(d)	174÷12	14.5	2	M1 for adding the numbers and dividing by 12 A1 cao

Q11.

Paper 1MA1: 2F			
Question	**Working**	**Answer**	**Notes**
		7.3225	M1 for 5.5225 **or** 1.8 A1 cao

Q12.

Question	Working	Answer	Mark	Notes
	 key 4|1 is 41	Diagram	B2 (B1) B1	for a fully correct diagram for an ordered diagram with one error or omission or for an unordered diagram) for an appropriate key

Q13.

Question		Working	Answer	Mark	Notes
			No with comparison of correct values	3	P1 starts process of comparison, e.g. writes two appropriate fractions or finds a percentage or works out a multiplier P1 complete process to give values that can be used for comparison A1 No and comparison of correct comparable values (e.g. 80% and 76.7...% **OR** 44.8 (people) accept Yes with a suitable argument

Q14.

		Working	Answer	Mark	Notes
*			Scheme B gives most	4	M1 for correct method to find 3% of 2500 M1 for correct method to compare Scheme A and Scheme B for the same length of time A1 for correct answers for both schemes C1 f.t. (dep on a comparison for the same length of time) for Scheme B gives the most OR M1 for correct method to convert £5.35 into a % of 2500 M1 for for correct method to compare Scheme A and Scheme B for the same length of time A1 for 2.5(68)(%) C1 f.t. (dep on a comparison for the same length of time) for Scheme B gives the most

Q15.

Question		Working	Answer	Mark	Notes
			mistakes identified	2	C1 points joined with curve, not line segments C1 points not plotted at mid-points

Q16.

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

Q17.

		Working	Answer	Mark	Notes
*		**(Method 1)** Angle *ACB* = 180 – 135 (= 45) (sum of angles on a straight line = 180) Angle *ABC* = 180 – 70 – 45 (=65) (sum of angles in a triangle = 180 (*x* =) 180 – 65 (=115) (sum of angles on a straight line = 180) OR **(Method 2)** Angle *ACB* = 180 – 135 (= 45) (sum of angles on a straight line = 180) (*x* =) 70 + 45 (=115) (exterior angle = sum of interior opposite angles) OR **(Method 3)** Angle DAB = 180 – 70 = 110 (sum of angles on a straight line = 180) (*x* =) 360 – 135 – 110 (sum of exterior angles of a polygon = 360)	*x* = 115	5	M1 for correct method to find angle *DAB* or angle *ACB* or angle *ABC* (may be implied by correct angle marked in diagram) M1 for complete correct method to find *x* A1 for *x* = 115 C2 (dep on M1) for fully correct reasons for chosen method no extras (C1 (dep on M1) for one correct reason for chosen method) [NB *x* = 115 must be stated explicitly, 115 only scores A0]

Q18.

Question		Working	Answer	Mark	Notes
			35.5	3	M1 $\frac{3}{8}\times 100\,(=37.5)$ or $\frac{27}{100}+\frac{3}{8}\left(=\frac{129}{200}\right)$ M1 $100-27-$"37.5" or $1-\frac{129}{200}$ A1 cao

Q19.

Paper 1MA1: 3F			
Question	**Working**	**Answer**	**Notes**
(a)	Draws LOBF Finds ht ÷ base = $\frac{85-20}{0-25}=-2.6$	No + reason	M1 Interpret question eg. draw line of best fit M1 Start to test eg. gradient eg. $\frac{85-20}{0-25}=-2.6$ C1 Gradient within range $\pm(2-3)$ and 'no'
(b)		The LOBF would have to be used outside the data	C1 Convincing explanation

Q20.

Question	Working	Answer	Notes
(a)		$13y-1$	M1 for expansion of one bracket A1 for full simplification
(b)		$35u^3w^7$	B1 for 2 of 35, u^3 and w^7 correct B1 cao

Q21.

Question		Working	Answer	Mark	Notes
	(a)		positive	1	B1 Accept with 'positive' valid extra words eg strong positive
	(b)		46 – 54	2	B2 46 – 54 Or M1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 44 A1 for given answer in the range 46 – 54

Q22.

Question		Working	Answer	Mark	Notes
	(a)		0915	1	B1 for 0915 or 9.15am or other times that identify the train: 0930, 0955, 1040
	(b)	0930-0800 = 1h30 or 90 min 1040-0915 = 1h25 or 85 min 1152-1030 = 1h22 or 82 min	82	3	M1 for an intention or attempt to work out the time of one train: eg 0930-0800 (=1h30oe) or 1040-0915 (=1h25oe) or1152-1030 (=1h22oe) M1 for an attempt to work out the time of all three trains; OR finding the difference between time duration s of at least two trains; OR stating the duration of at least one train correctly, with an attempt at another train duration ; OR stating two durations correctly. A1 82 or 1 h 22 min
	(c)		45	1	SC: B2 for 1f 22min stated incorrectly eg 1:22, 1.22, 122 B1 cao

Q23.

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

Q24.

Question	Working	Answer	Mark	Notes
	x | -1 | 0 | 1 | 2 | 3 y | -5 | -2 | 1 | 4 | 7	Straight line from (–1, –5) to (3, 7)	3	**(Table of values)** M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correctly plotted) A1 for correct line between –1 and 3 **(No table of values)** M2 for at least 2 correct points (and no incorrect points) plotted **OR** line segment of $y = 3x–2$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points plotted with no more than 2 incorrect points) A1 for correct line between –1 and 3 **(Use of $y=mx+c$)** M2 for line segment of $y =3x–2$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 3 OR line drawn with a y intercept of –2 and a positive gradient) A1 for correct line between –1 and 3

Q25.

PAPER: 5MB3F_01					
Question		Working	Answer	Mark	Notes
	(a)		145	1	B1 accept 143 – 147
	(b)		7 – 9	4	M1 for carrying out a correct measurement of one of the lines eg (AC as) 10.3 – 10.7 or (BC as) 7.8 – 8.2 or (AB as) 6.3 – 6.7 M1 for scaling at any stage (by ×2) M1 for complete process of lengths AC – (AB + BC) ; scaled or unscaled A1 for answer in range 7 – 9

Q26.

Question		Working	Answer	Mark	Notes
			161.50	5	M2 for a correct method to decrease 6720 by 20%, eg 6720 × 0.8 (= 5376) or 6720 × 0.2 (= 1344 and 6720 – 1344(= 5376)) (M1 for a correct method to find 20% of 6720 eg 6720 × 0.2 or $\frac{20}{100}$ × 6720 (= 1344)) M1 for subtracting 1500 (= 3876) after a percentage calculation M1 "3876" ÷ 24 after the subtraction of 1500 A1 for 161.5(0)

Q27.

Question		Working	Answer	Mark	Notes
	(a)	24 ÷ 4 + 5	11	2	M1 for 24 ÷ 4 + 5 or 6 + 5 A1 cao
	(b)	13 = ? ÷ 4 + 5 ? = (13 – 5) × 4	32	3	M2 for (13 – 5) × 4 (M1 for 13 – 5 × 4 or 13 = ? ÷ 4 + 5 or 13 – 5 or × 4 seen as second operation) A1 cao SC B1 for 47 as answer NB accept reverse flowcharts for inverse operations

Q28.

Paper 1MA1: 3F			
Question	Working	Answer	Notes
		252	P1 For start to process eg. radius = 12 ÷ 4 (= 3) M1 Method to find area of trapezium or semicircle or circle P1 Process to find area of the shaded region A1 251.7 – 252

Q29.

Question	Working	Answer	Mark	Notes
(a)		0.625	B1	cao
(b)		$9.75 \leq x < 9.85$	B2	$9.75 \leq x < 9.85$
			[B1	for 9.75 **or** 9.85 (or $9.84\dot{9}$)]

Q30.

Question	Working	Answer	Mark	Notes
		$y = 3x - 1$	M1	for $y = 3x + c$ or a line drawn with gradient 3 passing through A
			A1	oe

Q31.

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

Q32.

Question	Working	Answer	Mark	Notes
(a)		$\frac{3}{4}, \frac{1}{4}$	B1	for correct probabilities for A or for B or for first spin
		$\frac{3}{4}, \frac{1}{4}, \frac{3}{4}, \frac{1}{4}$	B1	all correct
(b)		$\frac{3}{16}$	M1	for process to find combined probability, e.g. $\frac{3}{4} \times \frac{1}{4}$
			A1	for $\frac{3}{16}$ oe, ft from diagram

Q33.

Paper: 5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
			$h = \frac{x-8}{5}$	2	M1 for intention to either subtract 8 from both sides or divide each term by 5 as a first stage of working A1 for $h = \frac{x-8}{5}$ oe

Q34.

Question		Working	Answer	Mark	Notes
		Angle *DEC* = 180 – 41 =139 Angles on a straight line sum to 180° Angle *EDC* = 60 – 38 **or** Angle *ABD* = 180 – 120 – 38 (=22) Co-interior/Allied angles of parallel lines sum to 180° **or** Angles in a triangle sum to 180° **and** Alternate angles *x* =)180 – '139' – '22' (=19) Angles in a triangle sum to 180° **OR** Angle *ADC* = 180° – 120° = 60° Co-interior/Allied	*x* = 19° and reasons	4	M1 for *DBC* = 38° **or** *ADC* = 60°(can be implied by *BDC* = 22°) **or** *ABC* = 60° **or** *DCB* = 120° **or** (*ABD* =) 180 – 120 –38 (=22) M1 for (*BDC* =) 60 − 38 (=22) **or** *BDC* = '22' **or** (*DEC* =) 180 − 41 (=139) **or** (*BCE* =) 180 −41 − 38 (=101) M1 (dep on both previous M1) for complete correct method to find *x* **or** (*x* =) 19 C1 for *x* = 19° **AND** Co-interior/allied angles of parallel lines sum to 180° **or** Opposite angles of a parallelogram are equal **or** Alternate angles **AND** Angles on a straight line sum to 180° **or** Angles in a triangle sum to 180° **or** Exterior angle of triangle equals sum of the two opposite interior angles **or** Angles in a quadrilateral sum to 360°
		angles of parallel lines sum to 180° Angle *EDC* = 22° Angle *ECD* = 41° – 22° = 19° Exterior angle of triangle equals sum of the two opposite interior angles **OR** Angle *DBC* = 38° Alternate angles Angle *BCE* = 101° Angle sum of a triangle is 180° Angle *BCD* = 120° Opposite angles of a parallelogram are equal Angle *ECD* = 120° – 101° = 19°			

Q35.

Question	Working	Answer	Mark	Notes
(a)		Shape drawn	M1	shape drawn in correct orientation at (4, 5) (3, 7) (7, 7)
			A1	cao
(b)		description	B1	ft for rotation, 90° anticlockwise, centre (5, 4) oe

Q36.

Question	Working	Answer	Mark	Notes
		33.7	P1	for starting to use Pythagoras, e.g. $4.5^2 + 7^2$
			P1	for complete process to find *KM*, e.g. $\sqrt{4.5^2 + 7^2}$ (= 8.321658489)
			P1	(dep P1) for a correct trigonometry statement, e.g. sin *KLM* = "8.32"…÷ 15
			A1	for answer in the range 33.6 to 33.7

Q37.

Question	Working	Answer	Mark	Notes
(a)(i)		155 000	B1	cao
(ii)		165 000 or 164 999 or 164 999.99	B1	165 000 or 164 999 or 164 999.99
(b)		200 000	M1	for recognising that 210 000 = 105% or a full method to find the original price eg 210 000 ÷ 1.05 oe (= 200 000)
			A1	cao

Q38.

Question	Working	Answer	Mark	Notes
	Ath = $\frac{13}{45} \times 360 = 104°$ Cyc = $\frac{17}{45} \times 360 = 136°$ Swi = $\frac{8}{45} \times 360 = 64°$ Gym = $\frac{7}{45} \times 360 = 56°$	Correct pie chart	M1	a method shown to calculate one angle, e.g. $\frac{13}{45} \times 360$ **or** $\frac{17}{45} \times 360$ **or** $\frac{8}{45} \times 360$ **or** $\frac{7}{45} \times 360$ **or** 1 correct angle drawn out of 4 sectors
			A1	All angles drawn correctly ±2°
			B1	Sectors labelled with sport (dependent on at least 2 angles drawn correctly and exactly 4 sectors)

Q39.

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
(a)(i)		19	2	B1 cao
(ii)		Reason		B1 explanation, e.g. add 4 each time
(b)		43	1	B1 cao
(c)		Yes with reason	1	B1 reason eg 1 less than 80 and 80 is a multiple of 4, or generate series to 79, or 79 is the 20th term, oe

Q40.

Question	Working	Answer	Mark	Notes
		14.5	M1	for $f \times x$ using midpoints e.g. $11 \times 3 + 13 \times 8 + 15 \times 14 + 17 \times 4 + 19 \times 1$
			M1	(dep M1) for $\Sigma fx \div 30$
			A1	accept 14.4 to 14.5

Q41.

Question	Working	Answer	Mark	Notes
		22	P1	process to use gradient, e.g. $\frac{d-10}{5-2} = 4$
			P1	for a complete process to rearrange equation formed to isolate d
			A1	cao

Q42.

Question	Answer	Mark	Mark scheme	Additional guidance
	$9p + 13$	M1	for method to expand one bracket, eg $5 \times p + 5 \times 3$ $(= 5p + 15)$ or $2 \times 1 - 2 \times 2p$ $(= 2 - 4p)$ or $-2 \times 1 - 2 \times -2p$ $(= -2 + 4p)$	If an attempt is made to multiply by -2 in the second brackets then it must be done consistently.
		A1	cao	

Q43.

Paper: 5MB3F_01					
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

Q44.

		Working	Answer	Mark	Notes
			144	3	M1 for exterior angle = 360 ÷ 5 (= 72) M1 (dep) for '72' + '72' or 2 × '72' A1 cao **OR** M1 for interior angle = $^{3 \times 180}/_{5}$ (= 108) M1 (dep) for 360 – 2 × '108' A1 cao **OR** M1 for interior angle = $^{3 \times 180}/_{5}$ (= 108) or exterior angle = 360 ÷ 5 (= 72) M1 (dep) for $180 - \left(\frac{3 \times 180}{5} - \frac{360}{5}\right)$ or 180 – ('108' – '72') A1 cao

Q45.

Question		Working	Answer	Mark	Notes
		25 ÷ 50 = 0.5 h = 30 min 25 ÷ 60 = 0.416 h = 25 min	5	3	M1 for 25 ÷ 50 **or** $^{60}/_{50}$ × 25 **or** 30 (min) **or** 0.5(h) **or** 25 ÷ 60 **or** $^{60}/_{60}$× 25 **or** 25 (min) **or** 0.41(6)(h) M1(dep) '0.5' –'0.41(6)'**or** '30' – '25' A1 cao OR M1 for 60 ÷ 25 (= 2.4) and 60 ÷ "2.4" **or** 50 ÷ 25 (= 2) and 60 ÷ "2" M1(dep) for '30' – '25' A1 cao

Q46.

Question	Working	Answer	Mark	Notes
		39%	P1	process to find proportion of group that are students , e.g. $\frac{15}{16}$
			P1	complete process to find the % of girls , e.g. $\frac{15}{16}\times\frac{5}{12}$
			A1	for 39(.0625)
				OR
			P1	process to scale up the ratio of teachers : students, so that students can be divided by 7+5 (=12),, e.g. 1 × 12 : 15 × 12 = 12 : 180 or a process to divide the "180" in the ratio 7:5,, e.g. 180 ÷ 12 × 7 (=105) **and** 180 ÷ 12 × 5 (=75)
			P1	complete process to find the % of girls , e.g. (75 ÷ (12+105+75)) × 100
			A1	for 39(.0625)

Q47.

		Working	Answer	Mark	Notes
			1180	3	M1 for a correct method to find the area of the cross section M1 (dep) for a complete correct method for the volume of the prism A1 cao OR M1 for a correct method to find the volume of one cuboid M1 (dep) for a complete correct method for the volume of the prism A1 cao

Q48.

Question	Working	Answer	Mark	Notes
(a)(i)		$\begin{pmatrix}4\\6\end{pmatrix}$	B1	cao
(ii)		$\begin{pmatrix}11\\14\end{pmatrix}$	M1 A1	for $\begin{pmatrix}2\\8\end{pmatrix}$ oe or $\begin{pmatrix}9\\6\end{pmatrix}$ oe cao
(b)		Diagram	B1	correct vector drawn

Q49.

Question	Working	Answer	Mark	Notes
		68	P1	for a process to find the number of vanilla cakes, eg $420 \times 2 \div 7$ oe (= 120)
			P1	for a process to find the number of banana cakes, eg 420×0.35 oe (= 147)
			P1	(dep P1) for a full process to find the number of lemon/chocolate cakes eg 420 – (vanilla cakes) – (banana cakes) (= 153)
			P1	(dep on previous P1) for a process to find the number of lemon cakes eg "153" ÷ 9 × 4 oe (= 68)
			A1	cao
				OR
			P1	for writing two proportions in the same format
			P1	for combining the proportions of vanilla and banana cakes eg 2/7 + 7/20 (= 89/140)
			P1	(dep P1) for a full process to find the proportion or number of lemon/chocolate cakes eg 1 – "89/140" (= 51/140)
			P1	(dep on previous P1) for a process to find the number of lemon cakes eg "51/140" × 420 ÷ 9 × 4 (= 68)
			A1	cao

Q50.

Question		Working	Answer	Mark	Notes
	(a)		–1, 0, 1, 2, 3	2	B2 for all 5 correct values; ignore repeats, any order (B1 for 4 correct (and no incorrect values) eg. 0, 1, 2, 3 **or** one additional value, eg –1, 0, 1, 2, 3, 4)
	(b)		$-4 < x \leq 3$	2	B2 for $-4 < x \leq 3$ **or** > -4 **and** ≤ 3 (B1 for $-4 < x$ **or** $x > -4$ **or** $x \leq 3$ **or** $3 \geq x$ **or** > -4 **or** ≤ 3 **or** $-4 \leq x < 3$)
	(c)	$3y - 2 > 5$ $3y > 7$	$y > 7/3$	2	(NB Accept the use of any letter) M1 for clear intention to add 2 to both sides (of inequality or equation) or clear intention to divide all terms by 3 **or** $3y > 7$ **or** $3y < 7$ **or** $3y = 7$ A1 $y > 7/3$ **or** $y > 2\ 1/3$ or $y > 2\ \dot{3}$ NB. final answer **must** be an inequality (SC B1 for $7/3$ oe seen if M0 scored)

Q51.

Question	Working	Answer	Mark	Notes
(a)		4	P1	for process to find area of at least 2 different faces, e.g. 95 × 18 and 80 × 18
			P1	for a complete process to find the surface area of one cushion, e.g. (95 × 18 + 80 × 18 + 95 × 80) × 2
			P1	for process to convert units, e.g. 80 ÷ 100 (= 0.8)
			P1	(dep on P2) for their area multiplied by 6 and divided by 4
			A1	cao
(b)		Reduces requirement	P1	for showing 4.4 is now covered or 2.93 tins or 3 tins
			C1	(dep) Statement that the number required of tins will be reduced

Q52.

Question	Working	Answer	Mark	Notes
		9	M1	for $\sin 30° = \frac{x}{18}$ or $18 \times \sin 30$
			A1	cao

Q53.

Paper: 5MB3F_01					
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

Q54.

Question	Working	Answer	Mark	Notes
		$\frac{1}{2}$, 3	M1	for a correct method to eliminate one variable (condone one arithmetic error)
			M1	(dep) for substituting found value in one of the equations or correct method after starting again (condone one arithmetic error)
			A1	cao

Q55.

Paper 1MA1:3F			
Question	Working	Answer	Notes
		Venn diagram	M1 for two overlapping and labelled ovals M1 for 2 and 6 in the intersection M1 for 5 and 7 in the universal set only C1 for a fully correct Venn Diagram

Q56.

Question	Working	Answer	Mark	Notes
(a)		$(x+13)(x-13)$	B1	cao
(b)		$6x^2 + x - 2$	M1	for all 4 terms (and no additional terms) correct with or without signs or 3 out of no more than 4 terms correct with signs
			A1	$6x^2 + x - 2$

Q57.

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

Q58.

Question	Working	Answer	Mark	Notes
		$x = -8, x = 3$	M1	for factorisation or for substitution into quadratic formula $(x \pm a)(x \pm b)$ where product of a and $b = 24$, eg $(x \pm 4)(x \pm 6)$ or difference of a and $b = 5$, eg $(x \pm 2)(x \pm 7)$ $\frac{-5 \pm \sqrt{5^2 - 4 \times 1 \times -24}}{2}$ oe (condone one sign error)
			M1	for $(x + 8)(x - 3)$ or for $\frac{-5 \pm \sqrt{121}}{2}$ oe
			A1	cao

Q59.

5MB3F_01 November 2015					
Question		Working	Answer	Mark	Notes
	(a)		0, 4, 3, −5	2	M1 for one correct value, could be taken from graph A1 cao
	(b)		correct curve	2	M1 for at least 4 points plotted correctly from table A1 for correct curve drawn

Q60.

PAPER: 1MA0_2H				
Question	Working	Answer	Mark	Notes
		116	3	M1 for 80% or 0.8 seen oe or $\frac{464}{0.8}$ (=580) M1 for $\frac{464}{0.8} - 464$ A1 cao **OR** M1 for 80% or 0.8 seen oe M1 for 464 ÷ 4 or 464 ÷ (80÷20) A1 cao