

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

Mathematics A

Paper 2 (Calculator)

Foundation Tier

Sample Assessment Material

Time: 1 hour 45 minutes

Paper Reference

1MA0/2F

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.*
- **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 100.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
– *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

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.

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2/2/2/3/2/2



Turn over

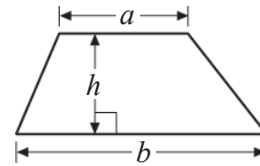
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GCSE Mathematics 1MA0

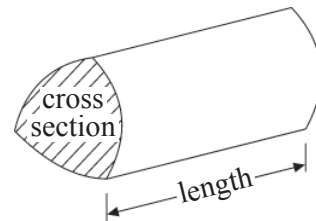
Formulae: Foundation Tier

**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross section \times length



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 Susie has one pound and sixty pence.

Her friend, Katie, has two pounds and five pence.

They want to buy a pizza between them.

The pizza costs £3.50

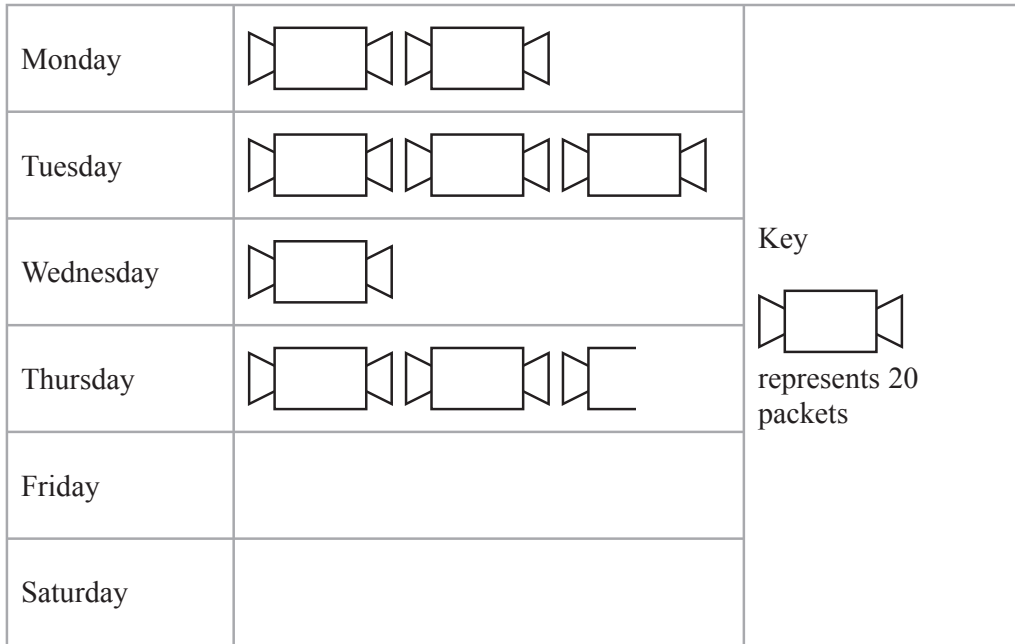
How much money will they have left?

Show your working here.



(Total for Question 1 = 2 marks)

2 The pictogram shows the number of packets of toffees sold by a shop some days in one week.



(a) Write down the number of packets of toffees that were sold on

(2)

(i) Tuesday,

..... packets

(ii) Thursday.

..... packets

40 packets were sold on Friday.

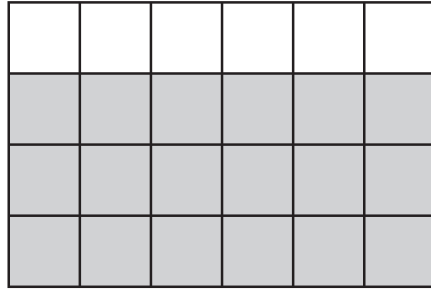
30 packets were sold on Saturday.

(b) Use this information to complete the pictogram.

(2)

(Total for Question 2 = 4 marks)

3

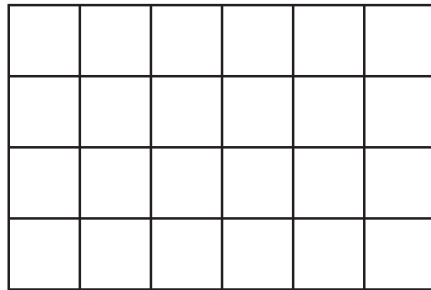


(a) Write down the fraction of this shape that is shaded.
Write your fraction in its simplest form.

(2)

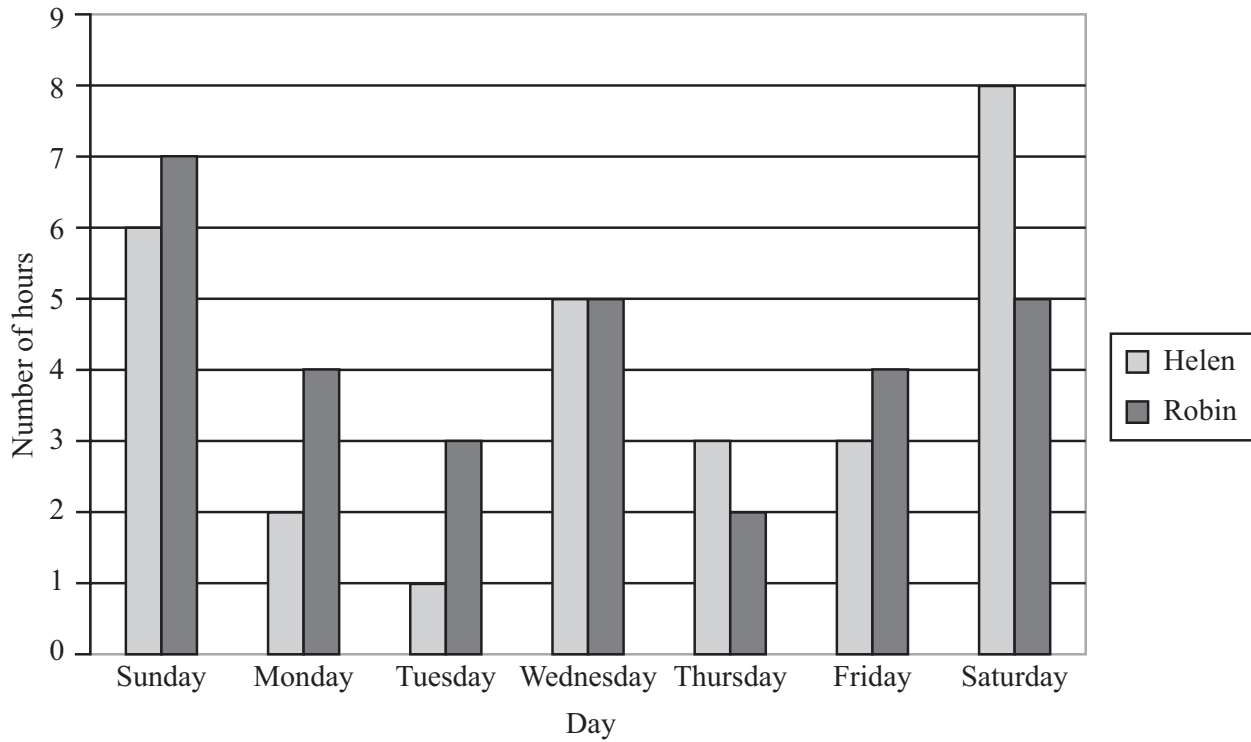
(b) Shade $\frac{2}{3}$ of this shape.

(1)



(Total for Question 3 = 3 marks)

4 Here is a dual bar chart showing the number of hours of TV that Helen and Robin watched each day last week.



(a) Write down the number of hours of TV that Helen watched on Monday.

(1)

..... hours

(b) How many more hours of TV did Robin watch than Helen watch last week?

(2)

.....

(c) Find the median of the number of hours Robin watched TV last week.

(2)

.....

(d) On Saturday and Sunday Helen watched 7 programmes altogether.

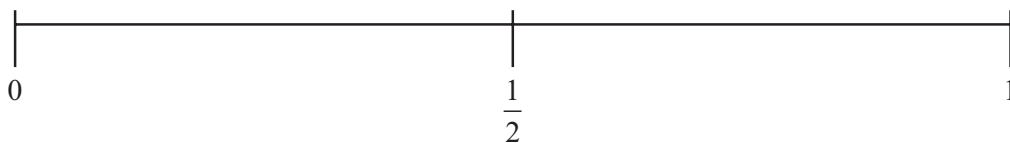
Work out the average length of the programmes that she watched.

(2)

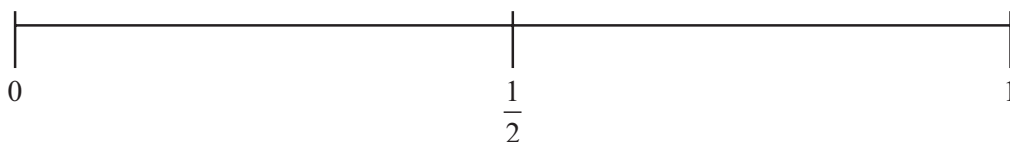
.....

(Total for Question 4 = 7 marks)

- 5 (a) On the probability scale below, mark with a cross (×) the probability that it will snow in London in June. (1)



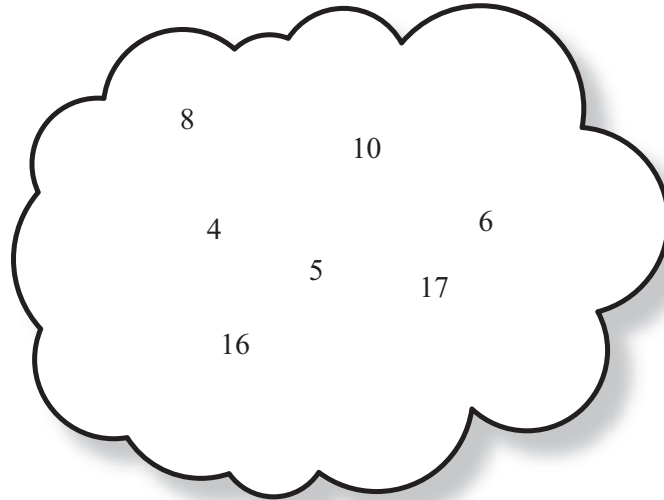
- (b) On the probability scale below, mark with a cross (×) the probability that it will rain in Manchester next year. (1)



- (c) What is the **probability** that you will get a head when you flip a fair coin? (1)

.....
(Total for Question 5 = 3 marks)

6



Using only the numbers in the cloud, write down

(i) an odd number

.....

(ii) a multiple of 4

.....

(iii) two numbers which have a sum which is a prime number

.....

(iv) the value of 2^3

.....

(Total for Question 6 = 4 marks)

7 Here is a sketch of triangle ABC .

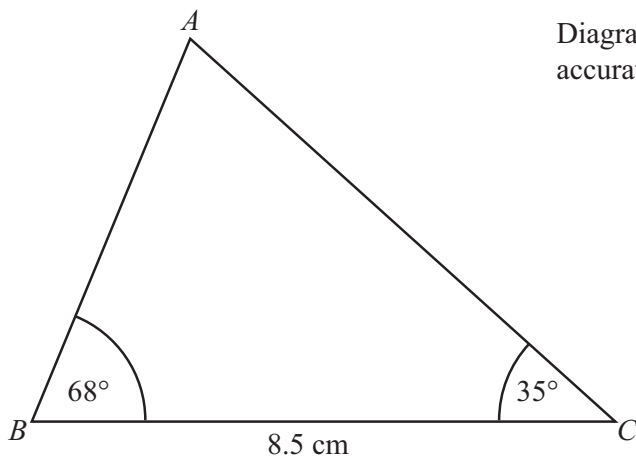


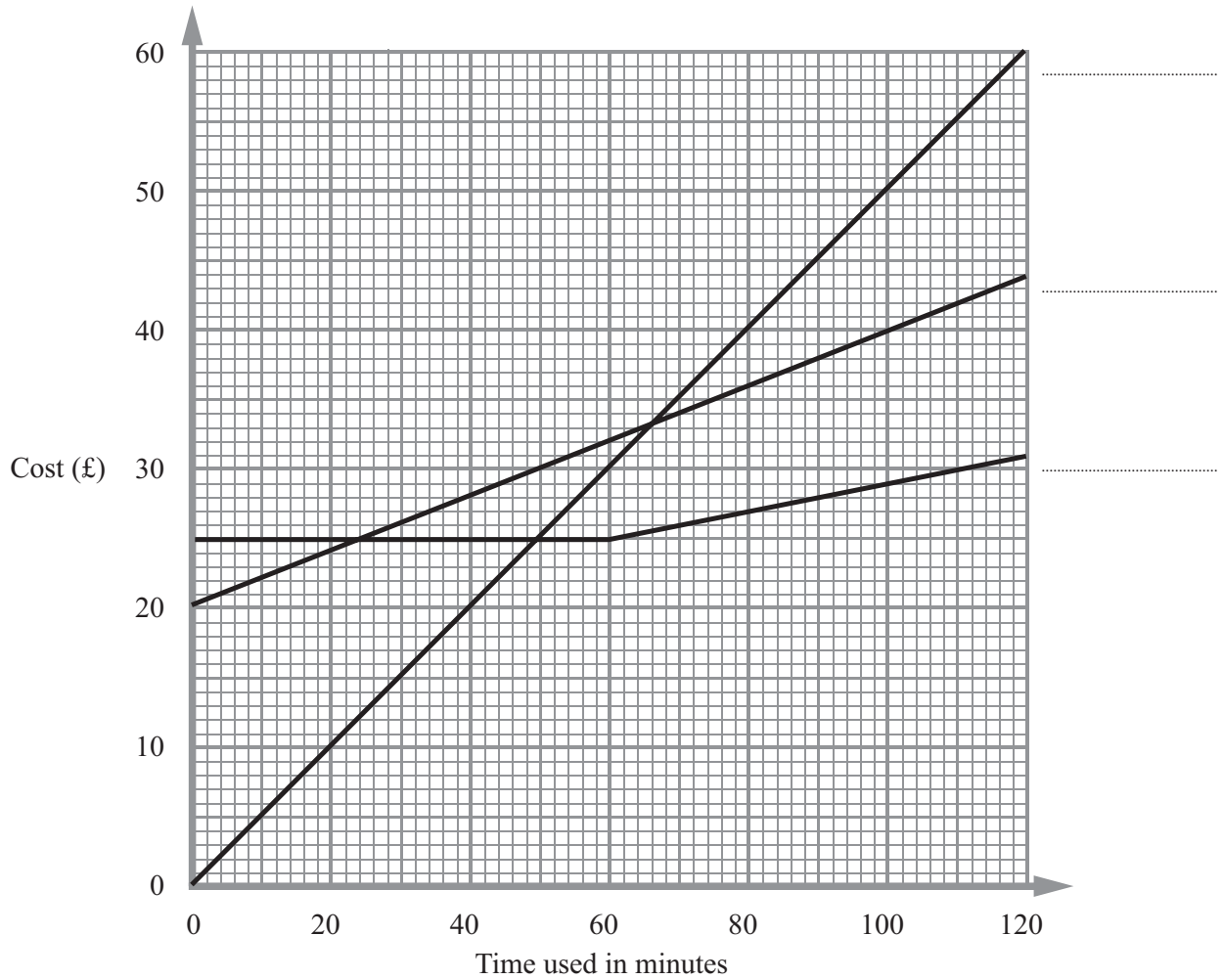
Diagram **NOT**
accurately drawn

$BC = 8.5\text{ cm}$
Angle $B = 68^\circ$
Angle $C = 35^\circ$

Draw an accurate diagram of triangle ABC in the space below.

(Total for Question 7 = 3 marks)

8 The graph shows the cost of using a mobile phone for one month for three different tariffs.



The three tariffs are

- Tariff A Rental £20 every minute costs 20p
- Tariff B Pay as you go every minute costs 50p
- Tariff C Rental £25 first 60 minutes free, then each minute costs 10p

(a) Label each line on the graph with the letter of the tariff it represents.

(1)

Jim uses tariff A for 100 minutes in one month.

(b) Find the total cost.

(1)

£

Fiona uses her mobile phone for about 60 minutes each month.

(c) Explain which tariff would be the cheapest for her to use.

You **must** give the reasons for your answer.

(2)

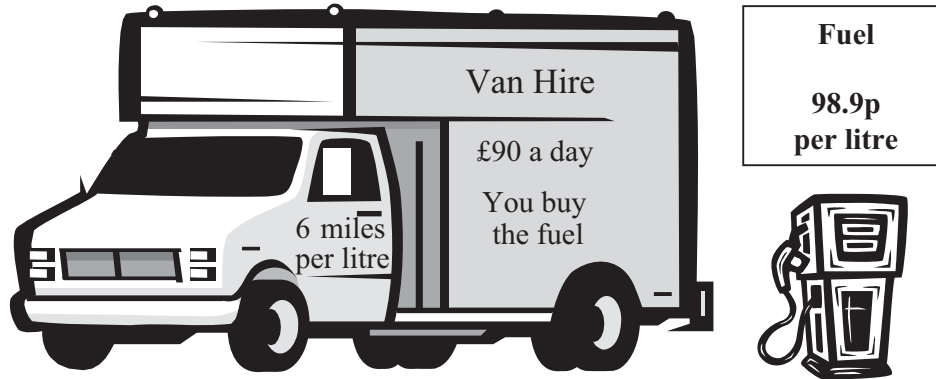
.....

.....

.....

(Total for Question 8 = 4 marks)

9 Jason hired a van.



The company charges £90 per day plus the cost of the fuel used.
The van can travel 6 miles for each litre of fuel used.
Fuel costs 98.9p for 1 litre.

On Monday Jason hired the van and drove from London to Cardiff.
On Tuesday Jason drove from Cardiff to Edinburgh.
On Wednesday, Jason drove from Edinburgh back to London and returned the van.

Jason thought the total cost would be about £400.

Jason uses this table for information about distances between cities.

London			
153	Cardiff		
212	245	York	
413	400	193	Edinburgh

Work out the total cost of hiring the van and the fuel used.



£

(Total for Question 9 = 8 marks)

10 This formula is used to predict the adult height of a baby girl.

$$H = \frac{F + M - 12.5}{2}$$

H = adult height of girl (cm)

F = height of father (cm)

M = height of mother (cm)

Karen and Keith have a baby girl.

They are interested in finding out how tall their baby girl is likely to grow.

Karen has a height of 156 cm.

Keith has a height of 172 cm.

(a) Use the formula to predict the adult height of their baby girl.

Show clearly how you get your answer.

(2)

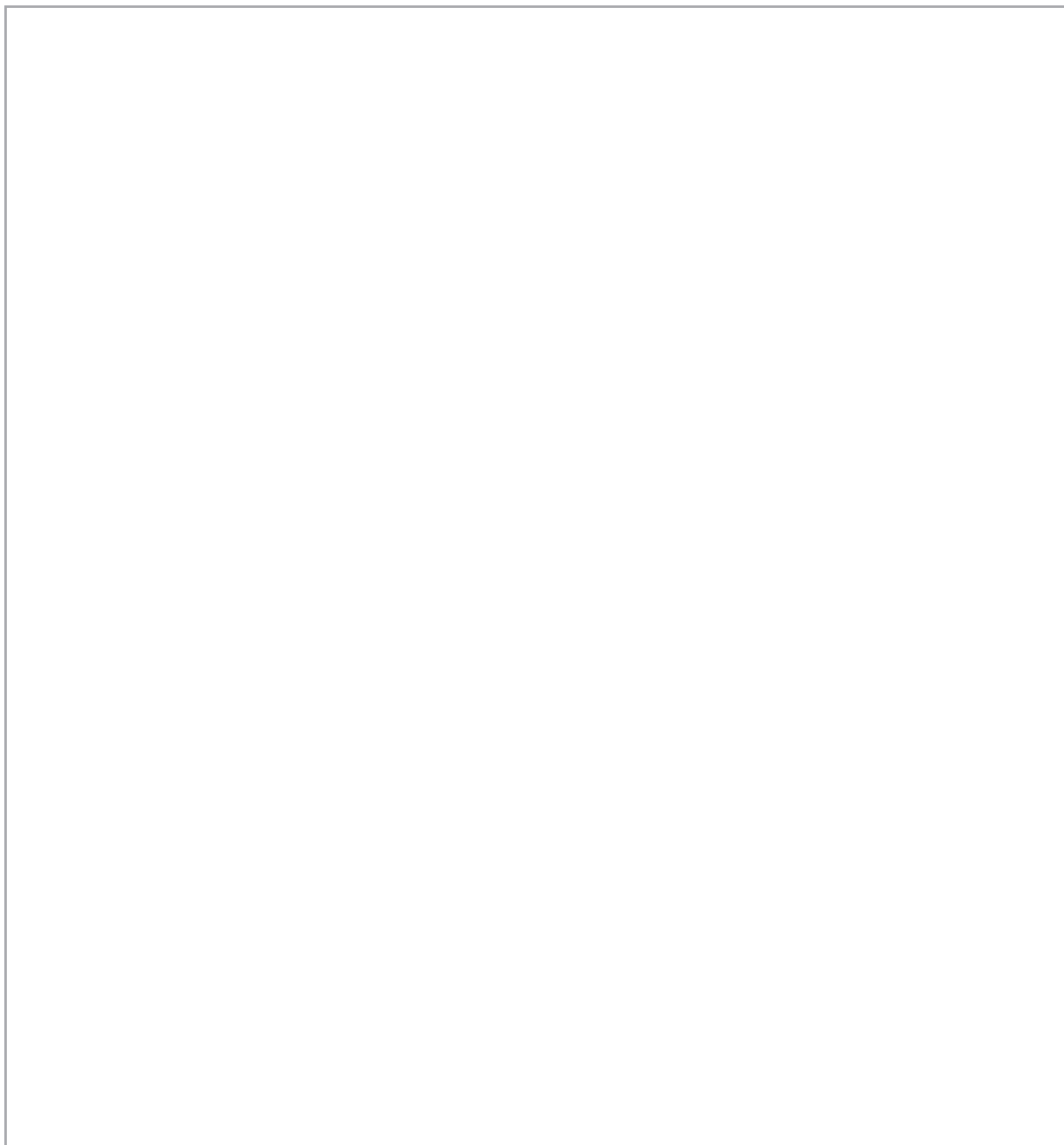
Height cm

John and Jenny also have a baby girl.
John and Jenny are the same height.

When they use the formula to predict the adult height of their baby girl they get an answer of 162 cm.

- (b) Find an estimate of Jenny's height.
Give your answer to the nearest centimetre.

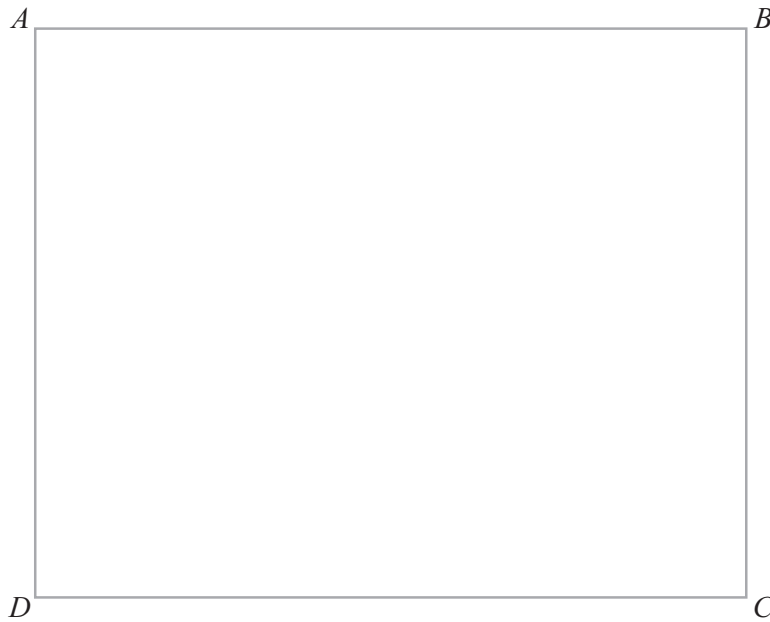
(3)



Height cm

(Total for Question 10 = 5 marks)

- 11 Bill is planning the layout of a school playground.
For safety reasons he has to mark part of the playground where children cannot play games.
He makes a plan of the playground drawn to a scale of 1 cm to 1 m.



Scale 1 cm represents 1 m

For Health and Safety reasons, children cannot play games

within 4 m of the corner *D*

Or

within 3 m of the side *BC*.

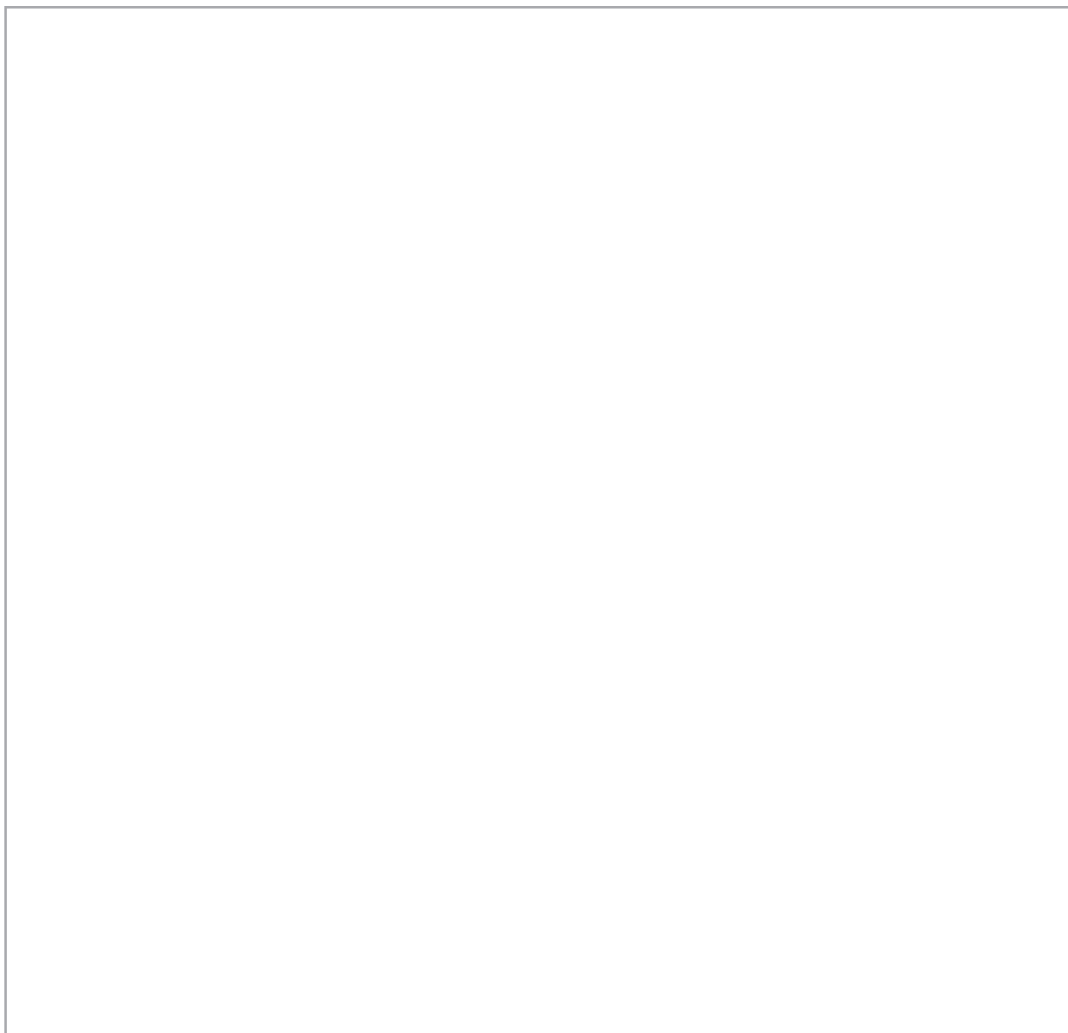
- (a) Complete the plan of the playground accurately to show where children cannot play games.

(4)

Children can play games on the rest of the playground.
There has to be at least 1 m^2 for each child.

***(b)** Calculate the largest number of children that can play in the rest of the playground.

(6)



.....
(Total for Question 11 = 10 marks)


12

Item	Costs (£)
Motor oil 1l	2.50
Wiper blades 1	8.75
Brake Pads 1	14.85
Antifreeze 1l	3.99
Hydraulic Fluid 1l	5.99
Spark Plugs	1.75

Mr Smith had his car serviced.

He had to pay for a 15 000 mile service, 3 litres of oil and 4 spark plugs.

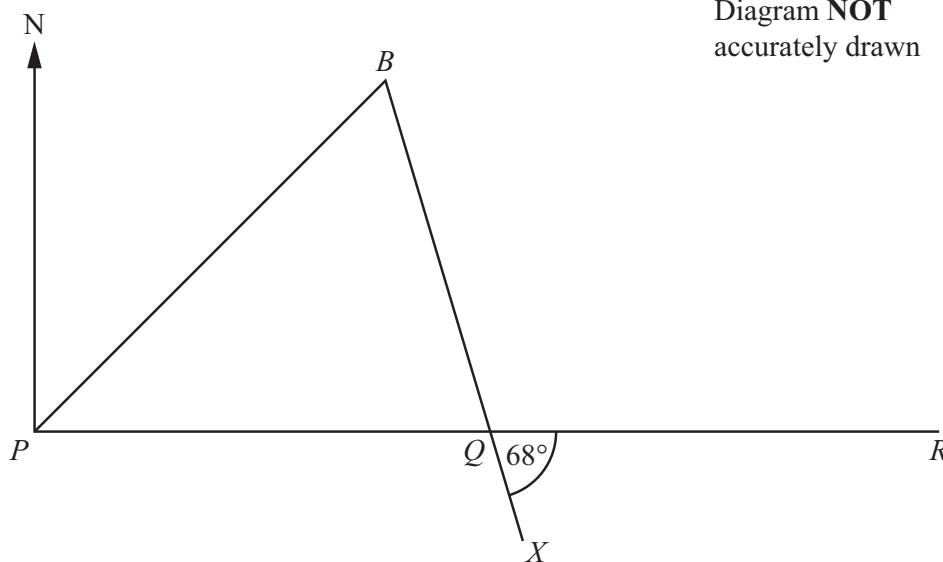
Complete his bill, and work out the total amount to pay.

<h1>Gary's Garage</h1>			
Item	Number of items	Cost of one item	Total
15 000 mile Service (labour charge)	1	£75.50	£75.50
Motor oil 1l			
Spark plugs			
Total			£
VAT at 17 $\frac{1}{2}$ % of Total			£
Total amount to pay			£

(Total for Question 12 = 6 marks)

13

Diagram **NOT**
accurately drawn



PQR is a straight line going East.
 B is on a bearing, 052° from P .
 B and Q are the same distance from P .

Find the bearing of X from B .
You must show your working out clearly.

.....
(Total for Question 13 = 3 marks)

- 14 In the diagram all of the angles are in degrees.
Find the size of angle CDE .

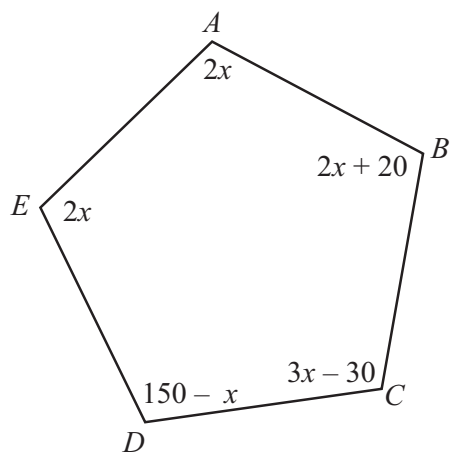
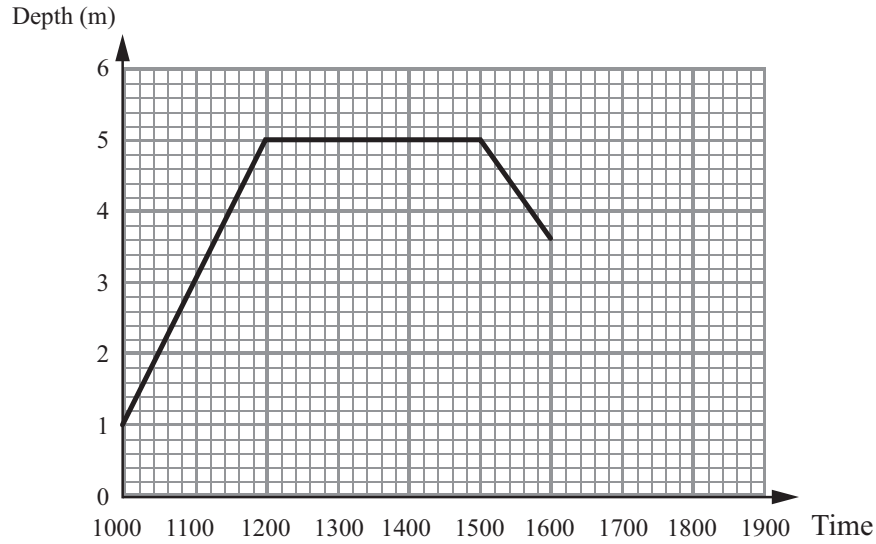


Diagram **NOT**
accurately drawn

.....
(Total for Question 14 = 4 marks)

15 Rain water is collected in a tank.

The graph gives information about the depth of the water in the tank between 1000 and 1600.



(a) Write down the depth of water at 1300.

(1)

..... m

(b) Write down the time at which the depth was 2 metres.

(1)

.....

After 1600, the water is used for irrigating a field.

The depth of water continues to fall at the same rate as it fell between 1500 and 1600.

(c) Find the time at which the depth of the water is zero.

(1)

.....

(Total for Question 15 = 3 marks)

16 Use your calculator to work out $\frac{\sqrt{13.2 - 6.8}}{3.25 + 4.9}$

Give your answer as a decimal.

Write down all the figures on your calculator display.

.....
(Total for Question 16 = 2 marks)

17 The equation $x^3 - 5x = 60$ has a solution between 4 and 5

Find this solution and give your answer correct to 1 decimal place.

You must show **all** your working.

$x =$

(Total for Question 17 = 4 marks)

***18** Alan and Bhavana are planning their fitness program.
They plan to run on parts of a field.
The diagram below shows a rectangular field 80 metres by 60 metres.

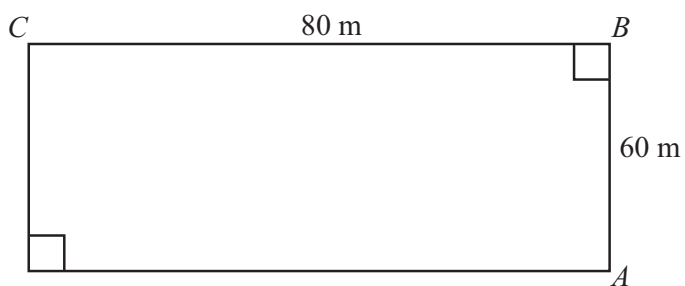


Diagram **NOT**
accurately drawn

Alan runs **around** the field from A to C (via B) at 5m/s .

Bhavana runs directly across the diagonal of the field from A to C at 3m/s .

If they both started at the same time, who would reach point C first?

You must explain your answer.

(Total for Question 18 = 6 marks)

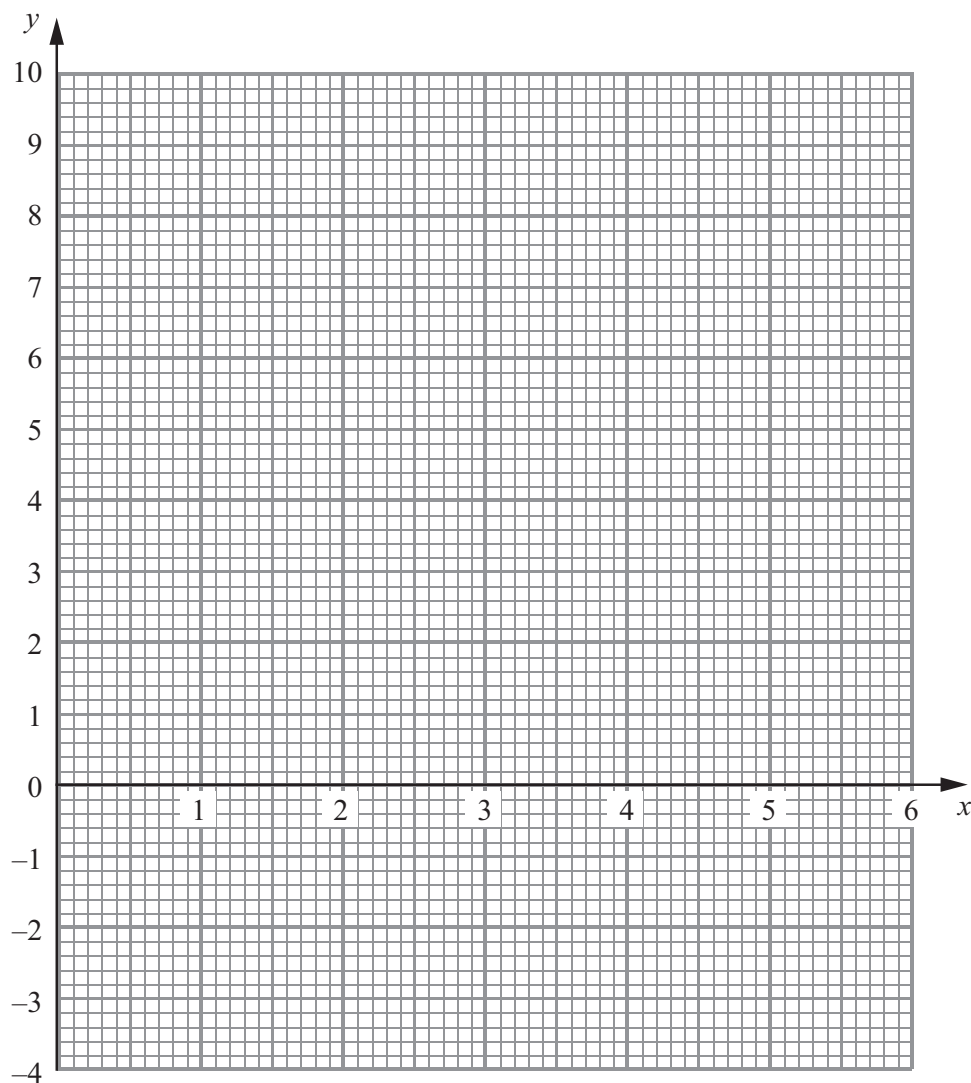
19 (a) Complete the table of values for $y = x(x - 3)$ for values of x from 0 to 5

(1)

x	0	1	2	3	4	5
y	0	-2		0	4	

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

(2)



The length of a rectangle is 3m less than the width. The area of the rectangle is 7 m^2

(c) Find an estimate for the width of the rectangle.

(2)

..... m

(Total for Question 19 = 5 marks)

20 Harry and Sally want to keep free range hens.

They have a rectangular piece of land that they intend to use for a chicken run.

The length of the land is 30 m and the width is 10 m.

Harry and Sally will need to put a fence, with a gate, around the chicken run.

They are advised that the least area a free range hen needs is 0.8 m^2 .

They want to have as many hens as they can.

Hens cost £7.50 each.

Putting in the fence and gate will cost £9.85 per metre.

Work out the total cost of buying the hens and fencing the land.

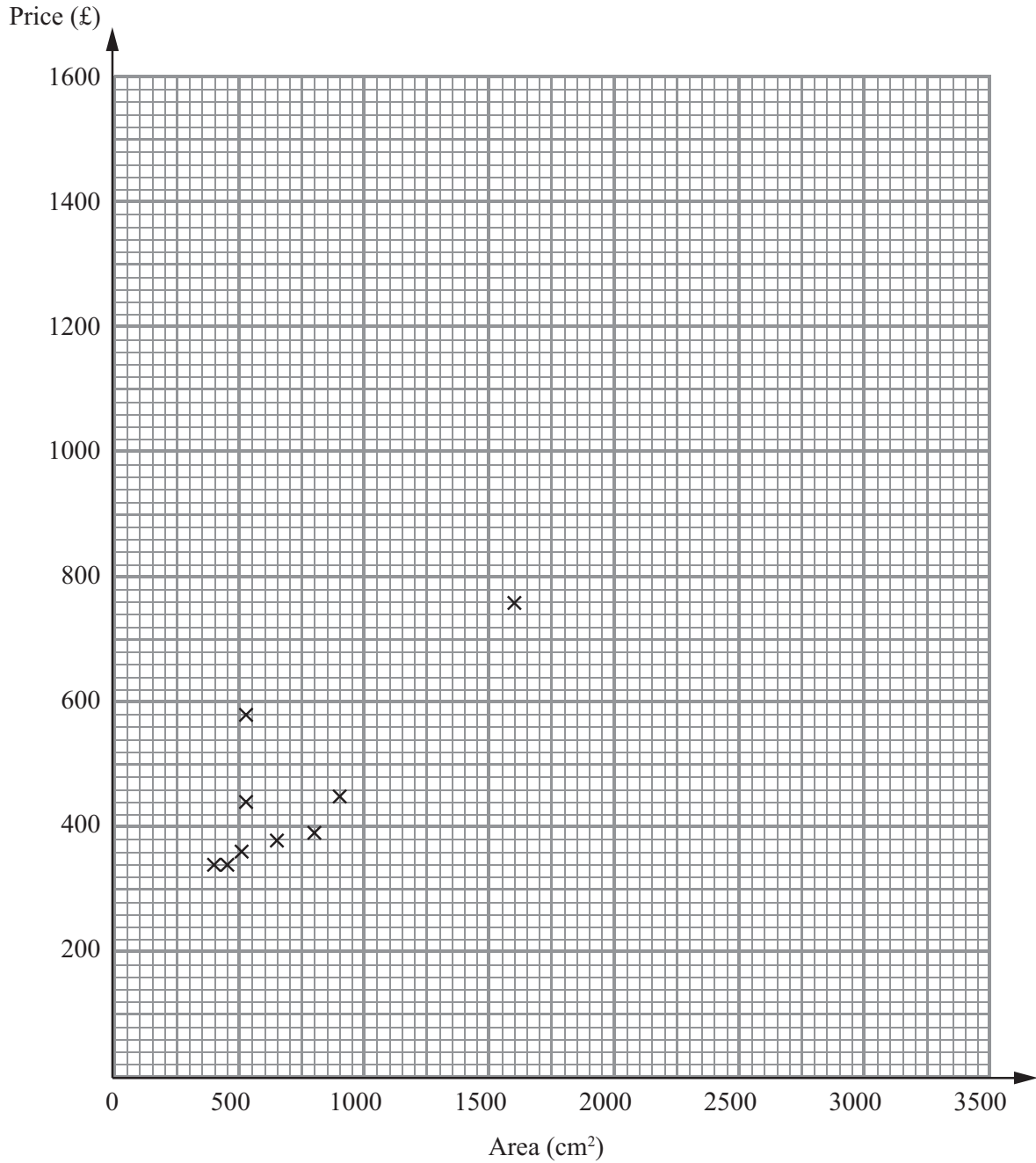




£

(Total for Question 20 = 9 marks)

21 Pablo is an artist. He wants to find estimates for the prices of some of the new pictures he has painted. The scatter graph, below, gives information about the area and the price of some of his old pictures.



The table shows the area and the price of another three of his old pictures.

Area (cm ²)	2000	2900	3260
Price (£)	1150	1250	1500

(a) Find an estimate of the price of a new picture with an area of 2500 cm².

(3)

£

All Pablo's pictures are rectangles.

One of his pictures has a price of £1000

Its length is 48 cm.

(b) Find an estimate for the width of the picture.

(2)

..... cm

(Total for Question 21 = 5 marks)

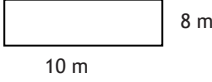
TOTAL FOR PAPER = 100 MARKS

Specification A: Paper 2 Foundation Tier

1MA0/2F				
Question	Working	Answer	Mark	Additional Guidance
1.	$1.60 + 2.05 = 3.65$	15p	2	B1 £3.65 oe B1 15p
Total for Question: 2 marks				
2.	(a)(i)	60	2	B1 60 cao
	(ii)	50		B1 50 cao
	(b)	2 full packets 1.5 full packets	2	B1 2 full packets cao B1 1.5 full packets
Total for Question: 4 marks				
3.	(a)	$\frac{3}{4}$	2	B2 $\frac{3}{4}$ cao (B1 $\frac{18}{24}, \frac{12}{16}, \frac{9}{12}, \frac{6}{8}$)
	(b)	Any 16 squares shaded	1	B1 Any 16 squares shaded
Total for Question: 3 marks				

1MA0/2F				
Question	Working	Answer	Mark	Additional Guidance
4.	(a)	2	1	B1 cao
	(b)	2 hours	2	M1 finds the totals of Robin and Helen. A1 cao OR M1 find the differences of Robin and Helen A1 cao
	(c)	4 hours	2	M1 orders the values A1 cao
	(d)	2	2	M1 attempts to find mean A1 2 cao
Total for Question: 7 marks				
5.	(a)	Correct plot	1	B1 Cross placed within 0.5 cm to right of 0 inclusive
	(b)	Correct plot	1	B1 Cross placed within 0.5 cm to left of 1 inclusive
	(c)	$\frac{1}{2}$	1	B1 0.5 oe
Total for Question: 3 marks				

1MA0/2F					
Question	Working	Answer	Mark	Additional Guidance	
6.	(i)		5 or 17	1	B1 5 or 17 or both
	(ii)		4, 8, or 16	1	B1 for one, two or three of 4, 8 or 16
	(iii)		5 and 6	1	B1 5 and 6 oe
	(iv)		8	1	B1 cao
Total for Question: 4 marks					
7.	8.5 cm line drawn angles at B and C drawn	Correct Construction of triangle	3	B1 8.5 cm line drawn tolerance ± 0.2 cm B1 angles at B and C drawn tolerance $\pm 2^\circ$ B1 fully correct within tolerance	
Total for Question: 3 marks					
8.	(a)		B, A, C	1	B1 cao
	(b)		£40	1	B1 cao
	(c)		C + reason	2	C2 correct + comparison with the two other tariffs (C1 correct + comparison with one other tariff or line drawn at 60 up from the time axis to intersect at least one line)
Total for Question: 4 marks					
9.	153 + 400 + 413 = 966 Number of litres used = $966 \div 6 = 161$ Cost of fuel $161 \times 98.9\text{p} =$ £159.23 Day cost = $3 \times 90 = 270$ Total = £159.23 + £270	429.23	8	B1 any one correct distance identified M1 $153 + 400 + 413$ A1 966 M1 '966' $\div 6$ M1 '161' $\times 98.9$ M1 3×90 M1 '159.23' + '270' A1 cao	
Total for Question: 8 marks					

1MA0/2F					
Question	Working	Answer	Mark	Additional Guidance	
10.	(a)	$\frac{156 + 174 - 12.5}{2}$	157.75	2	M1 substitute correctly A1 157.75 or 158
	(b)	$\frac{j + j - 12.5}{2} = 162$ $2j - 12.5 = 324$ $\frac{324 + 12.5}{2}$	168	3	M1 $\frac{j + j - 12.5}{2} = 162$ M1 correct method to isolate j A1 168 or better
Total for Question: 5 marks					
11.	(a)	complete diagram at end 		4	M1 quarter circle centre D radius 4 cm A1 clear indication of region by shading in or shading out M1 straight line parallel to BC 3 cm away A1 clear indication of the region by shading in or shading out.
	(b) QWC i, ii	Area = $\frac{\pi \times 4^2}{4} = 12.56637\dots$ Area = $3 \times 8 = 24$	43	6	M1 $\pi \times 4^2$ M1 3×8 A1 sight of either correct area A1 36.56637... M1 $8 \times 10 - '36.56637\dots' = 43.4336\dots$ C1 43 QWC: Decision should be stated, following on from working out
Total for Question: 10 marks					
12. FE		$3 \times 2.5 = 7.50$ $4 \times 1.75 = 7$ $75.50 + 7.50 + 7 = 90$ $9 + 4.5 + 2.25 = 15.75$	105.75	6	B1 3 and 7.50 B1 4 and 7 B1 90 ft M1 $9 + 4.5 + 2.25$ seen A1 15.75 A1 cao
Total for Question: 6 marks					
13.			154°	3	B1 for 38° B1 for 64° B1 cao
Total for Question: 3 marks					

1MA0/2F				
Question	Working	Answer	Mark	Additional Guidance
14.	$2x + 2x + 40 + 3x - 30 + 150 - x$ $+ 2x = 540$ $8x + 140 = 540$ $x = 50$	100°	4	M1 $2x + 2x + 40 + 3x - 30 + 150 - x + 2x$ M1 collects terms correctly A1 $x = 50$ A1 cao
Total for Question: 4 marks				
15.	(a)	5 m	1	B1 cao
	(b)	10:30	1	B1 10:25 – 10:35
	(c)	18:10 – 18:30	1	B1 18:10 – 18:30
Total for Question: 3 marks				
16.	$\frac{\sqrt{6.4}}{8.15}$	0.31040762 ...	2	M1 correct order of evaluation as evidenced by sight of 6.4 or 8.15 A1 0.31040(762....)
Total for Question: 2 marks				

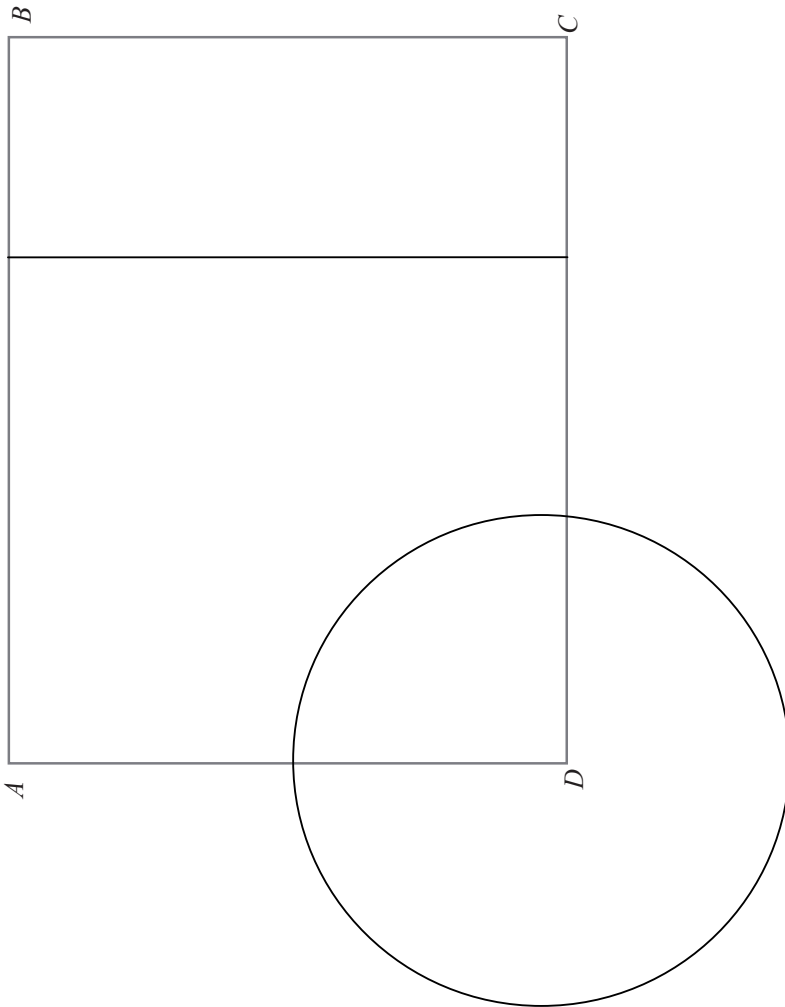
1MA0/2F				
Question	Working	Answer	Mark	Additional Guidance
17.	$f(x) = x^3 - 5x$ 4.00 44.00 4.10 48.42 4.20 53.09 4.30 58.01 4.40 63.18 68.62 or 4.50 68.63 4.60 74.34 4.70 80.32 4.80 86.59 4.90 93.15 5.00 100.00 4.35 60.56	4.3	4	B2 for trial between 4.3 and 4.4 inclusive (B1 for trial between 4 and 5 inclusive) B1 for different trial between 4.33 and 4.37 inclusive B1 (dep on at least one previous B1) for 4.3 only NB trials where x has 1 d.p should be rounded or truncated to at least 2 SF; trials where x has 2 d.p. or more should be rounded or truncated to at least 3 SF
				Total for Question: 4 marks
18. QWC ii	Alan $60 + 80 = 140$ $140 \div 5 = 28$ Bhavana $60^2 + 80^2 = 10000$ $\sqrt{10000} = 100$ $100 \div 3 = 33.33333.....$	Alan, with statement supporting explanation	6	B1 Alan runs 140 M1 '140' $\div 5$ M1 $60^2 + 80^2$ A1 100 A1 28 or 33.33333... seen C1 Alan stated with comparison of times and times attributed to correct person QWC: Decision stated with statement supporting explanation
				Total for Question: 6 marks

1MA0/2F																															
Question		Working	Answer	Mark	Additional Guidance																										
19.	(a)	0, -2, -2, 0, 4, 10	-2, 10	1	B1, B1 for each cao																										
	(b)		Smooth curve	2	B1 correct plot of their values B1 smooth curve through their points providing at least 1 mark earned in (a)																										
	(c)	<p>Draws $y = 7$</p> <p>OR</p> <p>T&I</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Width</th> <th>Area</th> </tr> </thead> <tbody> <tr><td>4</td><td>4</td></tr> <tr><td>4.1</td><td>4.51</td></tr> <tr><td>4.2</td><td>5.04</td></tr> <tr><td>4.3</td><td>5.59</td></tr> <tr><td>4.4</td><td>6.16</td></tr> <tr><td>4.5</td><td>6.75</td></tr> <tr><td>4.6</td><td>7.36</td></tr> <tr><td>4.7</td><td>7.99</td></tr> <tr><td>4.8</td><td>8.64</td></tr> <tr><td>4.9</td><td>9.31</td></tr> <tr><td>5</td><td>10</td></tr> <tr><td>4.55</td><td>7.0525</td></tr> </tbody> </table>	Width	Area	4	4	4.1	4.51	4.2	5.04	4.3	5.59	4.4	6.16	4.5	6.75	4.6	7.36	4.7	7.99	4.8	8.64	4.9	9.31	5	10	4.55	7.0525	4.5	2	<p>M1 draw $y = 7$</p> <p>A1 4.5 – 4.6 ft from graph</p> <p>OR</p> <p>Uses T&I</p> <p>B2 4.5 with $x^2 - 3x$ evaluated correctly at 4.5 and 4.6 (B1 Locates 'root' between 4 and 5 at least 2 evaluations or refers to table)</p>
Width	Area																														
4	4																														
4.1	4.51																														
4.2	5.04																														
4.3	5.59																														
4.4	6.16																														
4.5	6.75																														
4.6	7.36																														
4.7	7.99																														
4.8	8.64																														
4.9	9.31																														
5	10																														
4.55	7.0525																														
					Total for Question: 5 marks																										

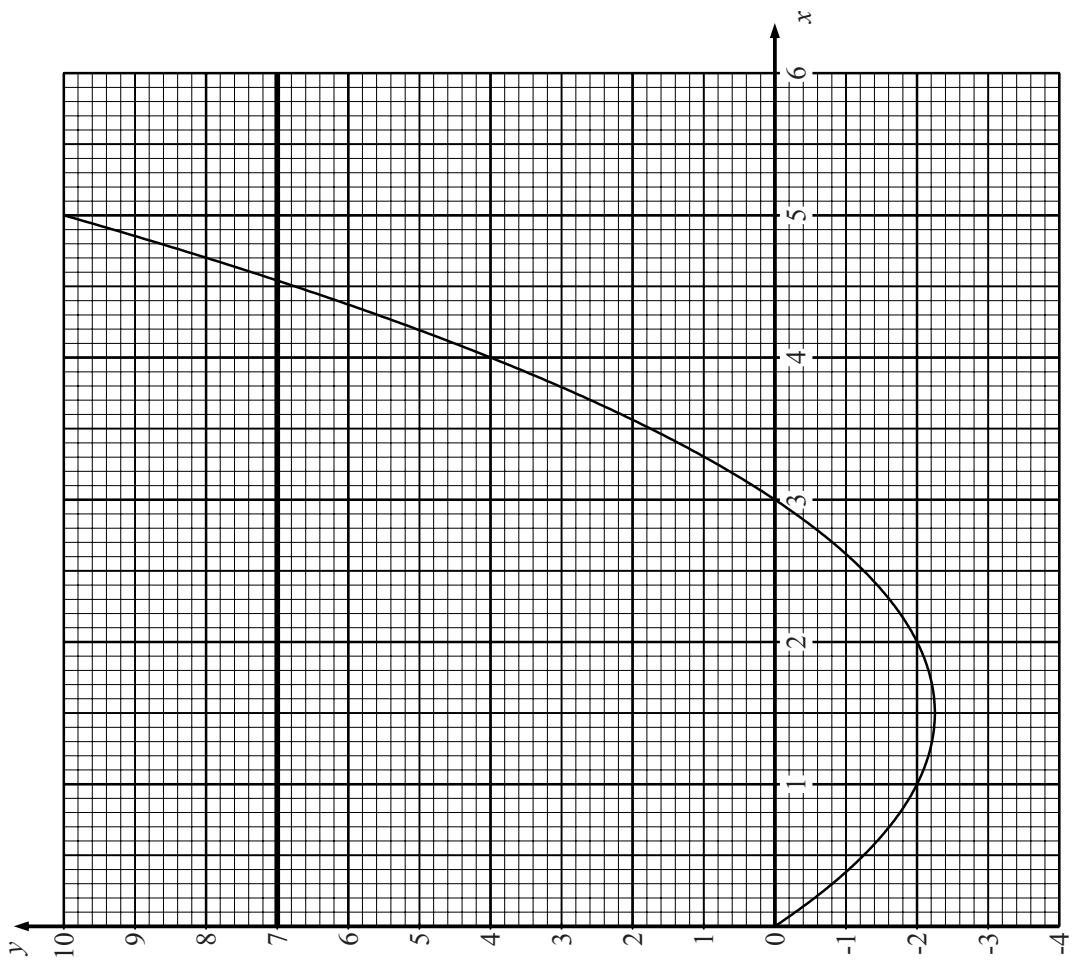
1MA0/2F				
Question	Working	Answer	Mark	Additional Guidance
20. FE	Area of land = 30×10 = 300 m^2 Perimeter of land = $30 + 30 + 10 + 10 = 80 \text{ m}$ No. of hens = $300 \div 0.8 = 375$ Cost of hens = $375 \times 7.5 =$ £2812.50 Cost of fencing = 80×9.85 = £788 Total cost = £2812.50 + £788 = £3600.50	£3600.50	9	M1 for area of land $30 \times 10 = 300\text{m}^2$ M1 for perimeter of land = $30 + 30 + 10 + 10 = 80\text{m}$ M1 for " 300 " $\div 0.8$ A1 (ft) for 375 hens M1 for " 375 " $\times 7.5$ A1 (ft) for £2812.50 M1 for " 80 " $\times 9.85$ A1 (ft) for £788 A1 cao for total cost
				Total for Question: 9 marks

1MA0/2F					
Question		Working	Answer	Mark	Additional Guidance
21. FE	(a)	Plots further data Draws line of best fit Reads off value from 2500	£ 1100– 1200	3	M1 plots further figures M1 draws line of best fit A1 1100 – 1200
	(b)	Draws $y = 1000$ '2000' $\div 48$	42	2	M1 draws $y = 1000$ and divides by 48 A1 40 – 44
Total for Question: 5 marks					

11.



Scale 1 cm represents 1 m



21.

