

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

Mathematics A

Paper 2 (Calculator)

Higher Tier

Sample Assessment Material

Time: 1 hour 45 minutes

Paper Reference

1MA0/2H

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.

S37713A

©2009 Edexcel Limited.

2/2/2/2/3/2



S 3 7 7 1 3 A 0 1 2 5

Turn over ►

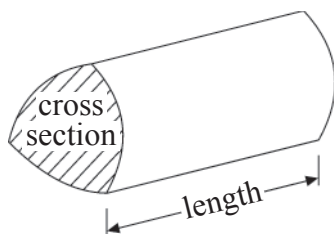
edexcel 
advancing learning, changing lives

GCSE Mathematics 1MA0

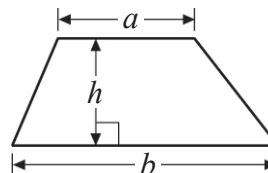
Formulae – Higher Tier

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

Volume of a prism = area of cross section \times length

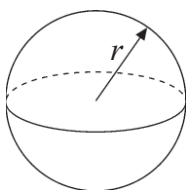


Area of trapezium = $\frac{1}{2}(a + b)h$



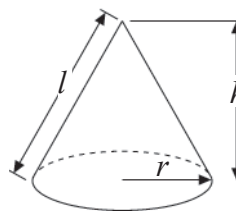
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

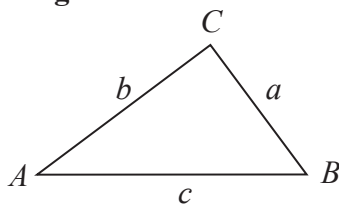


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 Peter won £75 as a prize.

He gave $\frac{4}{5}$ of the prize money as a present to Roger and Bethan.

Roger and Bethan shared the present in the ratio 2:3

Work out how much they each got.

Roger

Bethan

(Total for Question 1 = 4 marks)

- 2 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.

$x = \dots\dots\dots$

(Total for Question 2 = 4 marks)

3

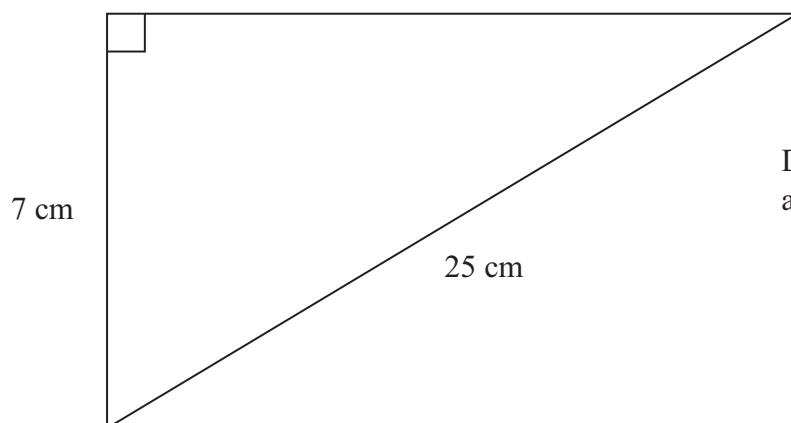


Diagram **NOT**
accurately drawn

Calculate the area of this right-angled triangle.

.....
(Total for Question 3 = 4 marks)

- 4 Imran wants to work out how much tax he needs to pay.

Last year he earned £18 000

He does not pay Income tax on the first £6475 he earned.

He pays tax of 20 pence for each pound he earned above £6475

He pays the tax in two equal half-yearly instalments.

- *(a) How much Income tax does Imran have to pay in his first half-yearly instalment?

(4)

Imran wants to know what percentage of his earnings he pays in tax.

- (b) Calculate the Income tax Imran has to pay as a percentage of his earnings last year.

(2)

..... %

(Total for Question 4 = 6 marks)

- 5 Here is some information about the time, in minutes, it took the 21 teachers at a school to get to work on Monday.

13 18 20 35 45 34 44

23 33 12 46 21 22 17

22 31 23 8 15 22 10

- (a) Draw an ordered stem and leaf diagram to show this information.

(3)

Roadworks near the school meant that the time to travel to school by every teacher on Tuesday was increased by 5 minutes.

- (b) What was the median of the times on Tuesday?

(2)

..... minutes

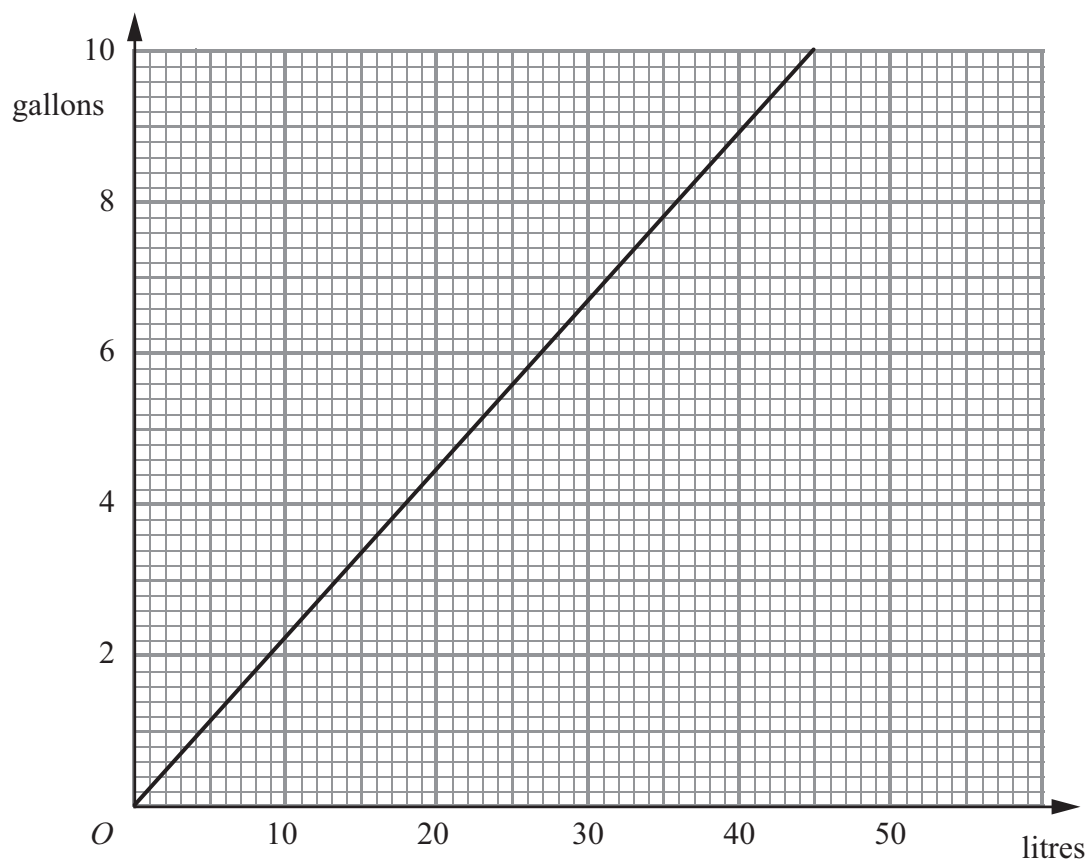
- (c) State whether the interquartile range of the times on Tuesday would be less, greater or the same as the interquartile range of the times on Monday.
Give a reason for your answer.

(1)

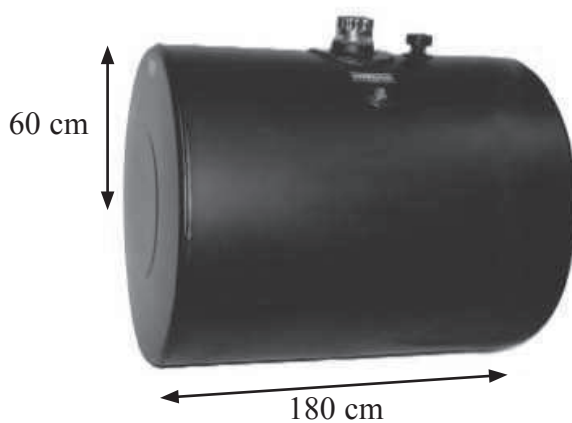
.....
.....

(Total for Question 5 = 6 marks)

6 The graph can be used to convert between gallons and litres.



The diagram shows a central heating oil tank.



The oil tank is in the shape of a cylinder of length 180 cm and radius 60 cm.

The oil tank contains 200 gallons of oil.

*(a) Is the oil tank more or less than $\frac{1}{2}$ full?

(5)

The oil has a density of 0.85 g/cm^3 .

(b) Work out, in kg, the mass of the oil in the tank.

(3)

..... kg

(Total for Question 6 = 8 marks)

- 7 The table shows information about the number of hours that 120 children used a computer last week.

Number of hours	Frequency
$0 < h \leq 2$	10
$2 < h \leq 4$	15
$4 < h \leq 6$	30
$6 < h \leq 8$	35
$8 < h \leq 10$	25
$10 < h \leq 12$	5

Work out an estimate for the mean number of hours that the children used a computer.
Give your answer to 2 decimal places.

(4)

..... cm

(Total for Question 7 = 4 marks)

8 Fred and Jim pay Malcolm to do some gardening.

Fred has £ x

Jim has ten pounds less than Fred.

Fred pays one third of his money to Malcolm.

Jim pays half of his money to Malcolm.

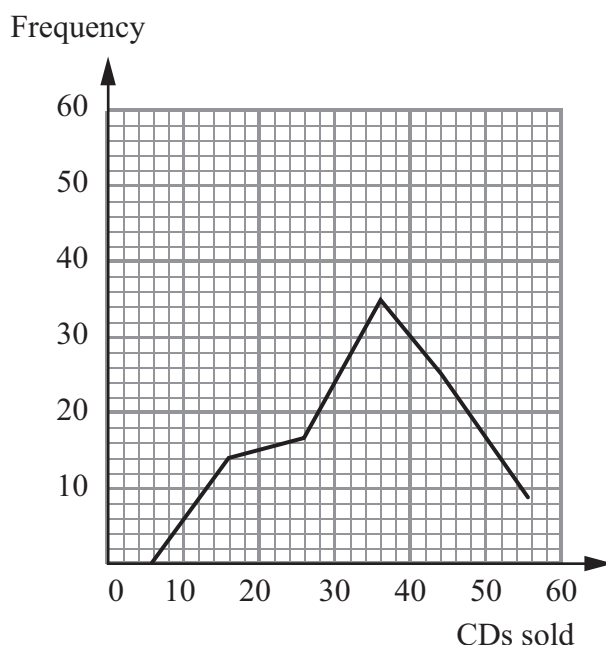
(a) Show that the amount that Malcolm is paid is $\frac{x}{3} + \frac{x-10}{2}$. (1)

Malcolm is paid a total of £170

(b) Use algebra to show how much money Fred has left. (4)

(Total for Question 8 = 5 marks)

- *9 Kevin and Joe each manage a shop that sells CDs. Kevin's shop is in the High Street and Joe's is in the Retail Park. They want to compare the sales of CDs in each of their shops for the first 100 days of the year.



Kevin's information about the number of CDs sold each day in the High Street shop is shown on the grid. Each class interval is 10 CDs wide.

Joe's information about the number of CDs sold each day in the Retail Park shop is shown in the table.

Number of CDs sold each day	Frequency
0 – 10	10
11 – 20	34
21 – 30	24
31 – 40	13
41 – 50	7
51 – 60	12

Compare the sales of CDs in the two shops.

(Total for Question 9 = 4 marks)

10 (a) Simplify fully

$$(x^3)^{\frac{1}{2}} \times (x^2)^{\frac{1}{4}}$$

(3)

(b) Solve

$$(x - 1)(x + 2) = 18$$

(4)

(c) Solve the simultaneous equations

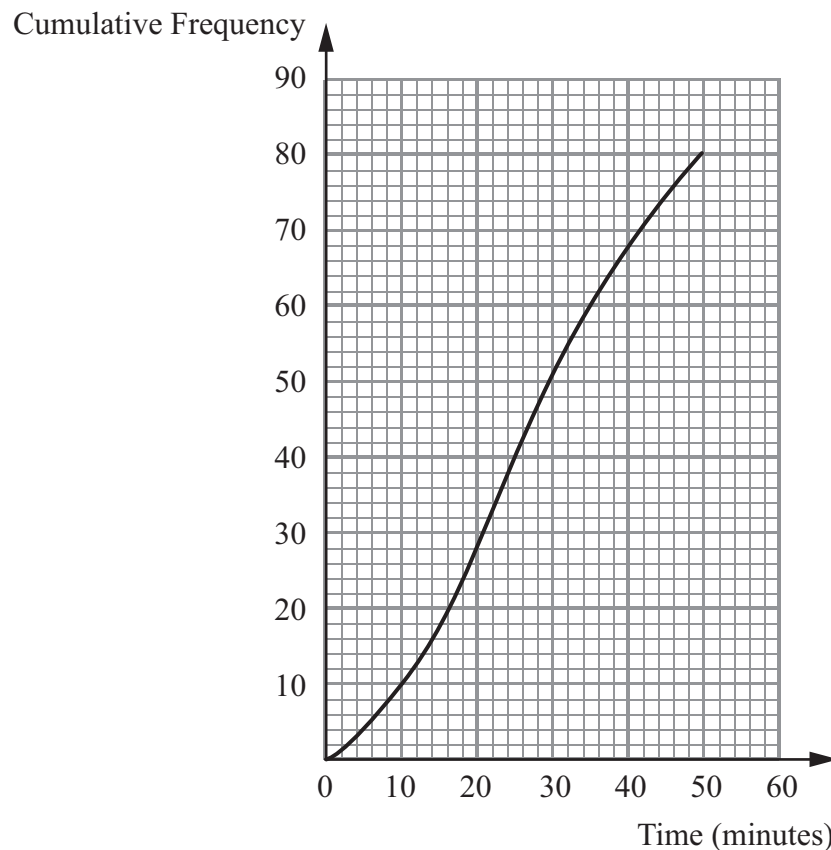
$$y = x^2 - 1$$

$$y = 5 - x$$

(5)

(Total for Question 10 = 12 marks)

- 11 The cumulative frequency diagram gives information about the time, in minutes, 80 people were kept waiting at a hospital casualty department.



- (a) Write down the number of people who waited for 20 minutes or less.

(1)

- (b) Work out an estimate of the number of people who waited for between 26 minutes and 40 minutes.

(2)

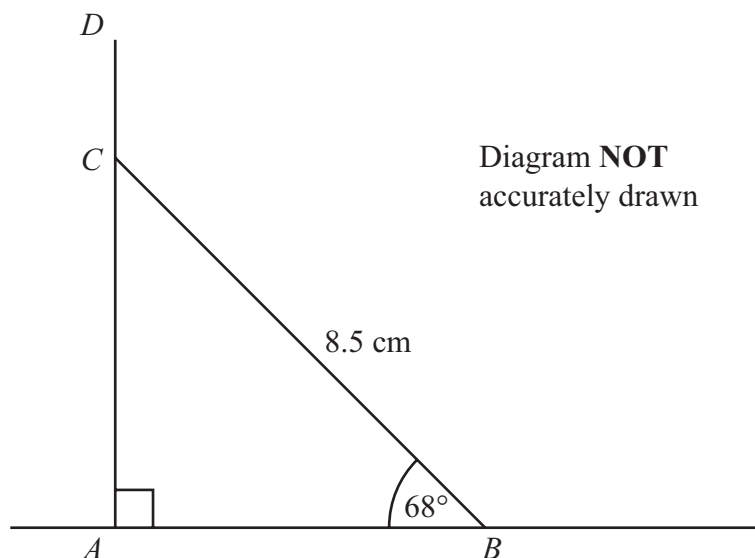
The hospital has a target that no more than 15% of people are kept waiting for 40 minutes or more in the casualty department each day.

- (c) Has the hospital achieved its target for the day?
You must explain your answer.

(2)

(Total for Question 11 = 5 marks)

***12**



The diagram represents a vertical pole ACD .

AB is horizontal ground.

BC is a wire of length 8.5 metres.

The height of the pole AD is 9 metres.

For the pole to be correctly installed, the length DC has to be at least 1 metre.

Show that the pole has been correctly installed.

(Total for Question 12 = 4 marks)

- 13** The time, T seconds, for a hot sphere to cool is proportional to the square root of the surface area, $A \text{ m}^2$, of the sphere.

When $A = 100$, $T = 40$.

Find the value of T when $A = 60$.

Give your answer correct to 3 significant figures.

..... seconds

(Total for Question 13 = 4 marks)

14 The line $y = 2x + 3$ meets the line $y = 4x + 2$ at the point P .

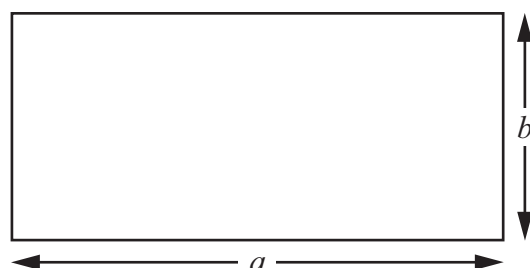
Find an equation of the line which is perpendicular to the line $y = 2x + 3$ and which passes through the point P .

(5)

.....
(Total for Question 14 = 5 marks)

15 Here is a rectangle.

Diagram **NOT**
accurately drawn



$a = 8.3$ cm correct to 1 decimal place.

$b = 3.6$ cm correct to 1 decimal place.

- (a) Calculate the upper bound of the area of this rectangle.
Write down all the figures on your calculator.

(2)

..... cm^2

- (b) Find the area of this rectangle correct to an appropriate number of significant figures.

(2)

..... cm^2

(Total for Question 15 = 4 marks)

16

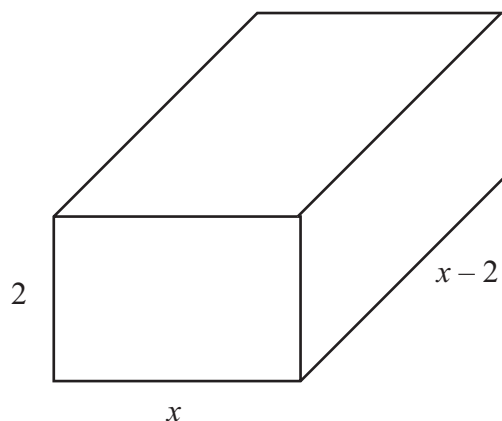


Diagram **NOT**
accurately drawn

The diagram shows a cuboid.
All the measurements are in cm.

The volume of the cuboid is 51 cm^3 .

(a) Show that $2x^2 - 4x - 51 = 0$ for $x > 2$

(4)

(b) Solve the quadratic equation

$$2x^2 - 4x - 51 = 0$$

Give your solutions correct to 3 significant figures.
You must show your working.

(3)

(Total for Question 16 = 7 marks)

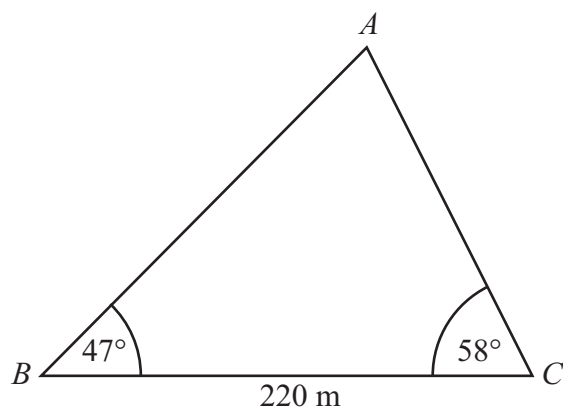


Diagram **NOT**
accurately drawn

Angle $ABC = 47^\circ$

Angle $ACB = 58^\circ$

$BC = 220$ m

Calculate the area of triangle ABC .

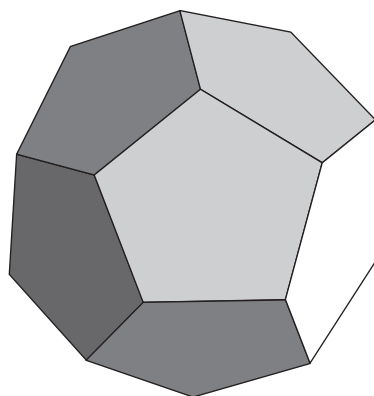
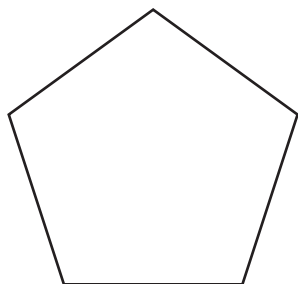
Give your answer correct to 3 significant figures.

.....
(Total for Question 17 = 5 marks)

18 Here is a regular dodecahedron.

A dodecahedron is a solid with 12 faces.

Each face is a regular pentagon.



Calculate the total surface area of a regular dodecahedron with edges of length 10 cm.

(Total for Question 18 = 9 marks)

TOTAL FOR PAPER = 100 MARKS

Specification A Paper 2 Higher Tier

1MA0/2H				
Question	Working	Answer	Mark	Additional Guidance
1.	$\frac{4}{5} \times 75 = 60$ $60 \div 5 = 12$ $3 \times 12 = 36$ $2 \times 12 = 24$	Roger 24 Bethan 36	4	M1 $\frac{4}{5} \times 75$ M1 '60' $\div (3+2)$ A1 Roger 24 A1 Bethan 36 (Allow 3 marks for the correct numbers the wrong way round)
Total for Question: 4 marks				
2.	$f(x) = x^3 - 5x$ x 4.00 4.10 4.20 4.30 4.40 4.50 4.60 4.70 4.80 4.90 5.00 4.35 68.62 or 68.63 74.34 80.32 86.59 93.15 100.00 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				

1MA0/2H				
Question	Working	Answer	Mark	Additional Guidance
3.	$25^2 - 7^2 = 576$ $\sqrt{576} = 24$ $\frac{1}{2} \times 24 \times 7$	84 cm ²	4	M1 $25^2 - 7^2$ M1 $\sqrt{25^2 - 7^2}$ M1 (dep) $\frac{1}{2} \times 24 \times 7$ A1 cao
Total for Question: 4 marks				
4. FE	(a) $18000 - 6475 = 11525$ $11525 \times \frac{20}{100} = 2305$	£ 1152.50	4	M1 $18000 - 6475$ A1 11525 M1 '11525' $\times \frac{20}{100}$ A1 £1152.50
(b)	$\frac{2305}{18000} \times 100$	12.8	2	M1 $\frac{2305}{18000} \times 100$ A1 ft on '2305'
Total for Question: 6 marks				

1MA0/2H					
Question		Working	Answer	Mark	Additional Guidance
5.	(a)	0: 8 1: 023578 2: 0122233 3: 1345 4: 456 Key 4 6 means 46 minutes	Correct stem and leaf	3	B3 Fully correct (B2 All entries correct, no key) (B1 correct entries unordered, key or no key) OR (B2 Three rows correct, key or no key) (B1 Two rows correct, key or no key)
	(b)	Old median = 22 New median = 22 + 5	27 minutes	2	M1 finds median correctly for original data and adds 5 A1 cao OR M1 Redoes table (ft) with each value increased by 5 and attempts to find median A1 cao
	(c)		The same + reason	1	C1 All the values have increased by 5 minutes so when you subtract the 5 minutes will cancel out.
Total for Question: 6 marks					

1MA0/2H					
Question		Working	Answer	Mark	Additional Guidance
6. FE QWC ii, iii	(a)	<p>1 gallon = 4.54 litres, 200 gallons = 908 litres = 908000 cm³ Vol of tank $60^2 \times \pi \times 180 =$ 2035752.04..cm³</p> <p>908000 < 1017876.02</p> <p>OR</p> <p>Vol of tank $60^2 \times \pi \times 180 = 2035752.04..cm^3$ Half vol of tank = 1017876.02 cm³ = 1017.876...litres</p> <p>1017.876 ÷ 4.54 = 224 gallons</p> <p>224 > 200</p>	No	5	<p>Response may convert into gallons, litres, or cm³</p> <p>Calculations may be performed in different orders</p> <p>M1 Using formulae to find volume of tank B1 Converts between litres and cubic centimetres M1 reads off graph for 1l, 2l , 4l, 5l or 10 litres within tolerance (4.4 – 4.6) A1 Answer in cm³, litres or gallons</p> <p>C1 Decision and reason QWC: Decision should be stated, with appropriate supporting statement</p>
	(b)	<p>“908000” cm³ × 0.85 g/cm³ = 771800 g</p>	771.8	3	<p>M1 “908000” × 0.85 M1(dep) 771800 ÷ 1000 A1 770 – 772</p>
Total for Question: 8 marks					
7.		$\frac{10 + 45 + 150 + 245 + 225 + 55}{120}$	6.08 hours	4	<p>M1 for mid interval values M1 for multiplying frequencies by mid-interval values M1 for adding (freq × mid-interval values) ÷ 120 A1 cao</p>
Total for Question: 4 marks					

1MA0/2H					
Question		Working	Answer	Mark	Additional Guidance
8.	(a)	<p>Fred pays $\frac{x}{3}$ and Jim pays $\frac{x-10}{2}$</p> <p>Malcolm gets £170 for Fred and Jim, so Malcolm gets</p> $\frac{x}{3} + \frac{x-10}{2} = 170$	Clear and coherent explanation	1	C1 a clear and coherent explanation
	(b)	<p>Fred has $\frac{2x}{3}$ left, so solving for x using</p> $\frac{x}{3} + \frac{x-10}{2} = 170$ $2x + 3(x-10) = 170 \times 6$ $5x = 1050$ $x = 210$ <p>OR</p> $\frac{x}{3} + \frac{x-10}{2} = \frac{2x + 3(x-10)}{6}$ $\frac{5x-30}{6} = 170$ $5x = 1050$ $x = 210$	£140	4	<p>M1 multiply through by 6 and cancels fractions</p> <p>M1 (dep) expand $3(x-10)$</p> <p>M1 (dep) collect terms on each side correctly</p> <p>A1 cao</p> <p>OR</p> <p>M1 collects terms over 6</p> <p>M1(dep) expand $3(x-10)$</p> <p>M1(dep) multiply through by 6 and collect terms</p> <p>A1 cao</p>
Total for Question: 5 marks					

1MA0/2H					
Question		Working	Answer	Mark	Additional Guidance
9.		Makes a comparison of the shape of the distribution by drawing	Correct comparisons	4	B1, B1, B1 for any 4 of the following done correctly Plots frequency polygon or produces table compares modes compares medians compares total sales C1 for comments on shape of the distributions QWC: Decisions should be stated, and all comments should be clear and follow through from any working or diagrams
QWC		Makes a comparison of the modal classes(31–40, 11–20)			
i, iii		Makes a comparison of the class intervals that contain the medians.(31–40, 21–30)			
FE		Works out an estimate of the total sales of each shop(2635, 3530)			
					Total for Question: 4 marks

1MA0/2H				
Question	Working	Answer	Mark	Additional Guidance
10. (a)	$x^{3/2} \times x^{1/2}$	x^2	3	B1 $x^{3/2}$ seen B1 $x^{2/4}$ oe seen A1 cao
(b)	$x^2 - 1x + 2x - 2 = 18$ $x^2 + x - 20 = 0$ $(x + 5)(x - 4)$	4, -5	4	M1 Correct expansion B1 $x^2 + x - 20 = 0$ B1 $(x + 5)(x - 4)$ A1 cao
(c)	$x^2 + x - 6 = 0$ $(x + 3)(x - 2)$ $x = -3, x = 2$	$x = -3, y = 8$ $x = 2, y = 3$	5	M1 Sets equations equal and rearranges B1 $x^2 + x - 6 = 0$ oe B1 $(x - 3)(x + 2)$ A2 Two correct pair of solutions A1 correct set of x values
Total for Question: 12 marks				

1MA0/2H					
Question		Working	Answer	Mark	Additional Guidance
11.	(a)		28	1	B1 27 – 29
	(b)	68 – 42	26	2	M1 68 – 42 A1 26 – 30 (need $\frac{1}{2}$ sq tolerance on each)
FE	(c)	15% of 80 = 12	Yes, with correct conclusion	2	M1 looks up 68 or 40 min on cumulative frequency A1 correct conclusion
Total for Question: 5 marks					
12. QWC ii, iii FE		$\sin 68^\circ = \frac{AC}{8.5}$ $AC = 8.5 \times \sin 68^\circ = 7.881$ $7.881 + 1 < 9$	Reason supported by calculation	4	M1 $\sin 68^\circ = \frac{AC}{8.5}$ M1 $AC = 8.5 \times \sin 68^\circ$ A1 7.88(1... C1 8.88(1... + conclusion QWC: Decision should be stated, supported by clearly laid out working Note $\frac{AC}{\sin 68} = \frac{8.5}{\sin 90}$ does not get marks until in the form $AC = \frac{8.5}{\sin 90} \times \sin 68$
Total for Question: 4 marks					

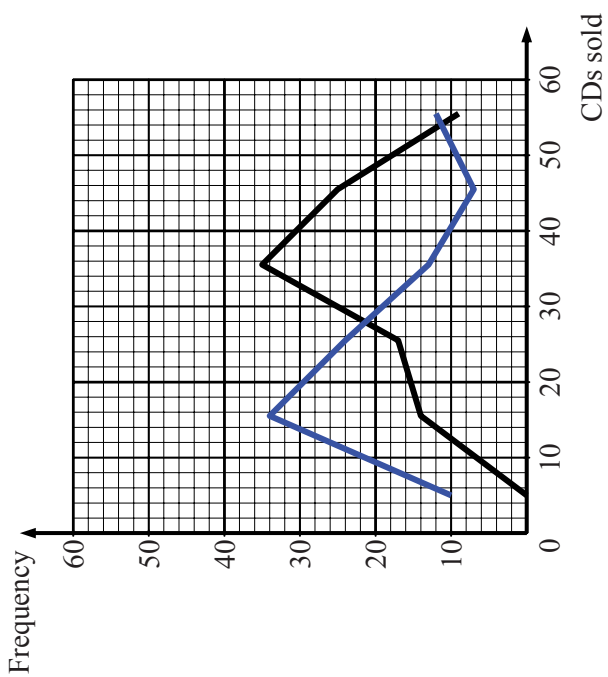
1MA0/2H				
Question	Working	Answer	Mark	Additional Guidance
13.	$T = k\sqrt{A}$; $40 = k\sqrt{100}$ $k = 4$ $T = 4\sqrt{A}$ $T = 4\sqrt{60}$	31.0	4	<p>M1 $T = k\sqrt{A}$ M1 $40 = k\sqrt{100}$</p> <p>A1 $T = 4\sqrt{A}$</p> <p>A1 for 30.98... or 31(.0)</p> <p>OR</p> <p>M2 for $\frac{T}{40} = \sqrt{\frac{60}{100}}$ oe</p> <p>M1 for $T = 40 \times \sqrt{\frac{60}{100}}$ oe</p> <p>A1 for 30.98... or 31.0</p>
				Total for Question: 4 marks

1MA0/2H		Additional Guidance		
Question	Working	Answer	Mark	
14. (b)	Eliminate y to get $2x + 3 = 4x + 2$, $x = 0.5$ $y = 4$	$y = -0.5x + 4.25$	5	M1 eliminate y M1 substitute the found value of x in one equation A1 both answers M1 an equation of the form $y = mx + c$ with either c correct or m correct or the correct gradient stated A1 cao
	OR $y = 2x + 3$ and $y = 4x + 2$ drawn correctly on graph paper Perpendicular drawn correctly through (0.5, 4) Intercept found Gradient found			OR B1 $y = 2x + 3$ drawn B1 $y = 4x + 2$ drawn M1 draws perpendicular though point of intersection M1 an equation of the form $y = mx + c$ with either c correct or m correct or the correct gradient stated A1 cao
Total for Question: 5 marks				
15. (a)	UB $8.35 \times 3.65 = 30.4775$	30.4775	2	M1 sight of 8.35 or 3.65 A1 30.4775
(b)	LB $8.25 \times 3.55 = 29.2875$	30	2	M1 8.25×3.55 A1 30 (dep on 8.25 X 3.55 seen)
Total for Question: 4 marks				

1MA0/2H					
Question		Working	Answer	Mark	Additional Guidance
16.	(a)	$\text{Vol} = x \times (x - 2) \times 2 = 51$ $\text{Vol} = 2x^2 - 4x - 51 = 0$	Derives given answer and condition	4	M1 $\text{Vol} = x \times (x - 2) \times 2$ M1 expands bracket correctly A1 (E1) sets equal to 51 B1 $x > 2$ as the lengths of the cuboid have to be positive.
	(b)	$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \times 2 \times (-51)}}{2 \times 2}$ $x = \frac{4 \pm \sqrt{424}}{4}$	6.15, -4.15 both to 3sf	3	M1 correct substitution (allow sign errors in a , b and c) into quadratic formula M1 $x = \frac{4 \pm \sqrt{424}}{4}$ A1 6.14(7..., - 4.14(7...)
Total for Question: 7 marks					
17.		Angle $BAC = 180^\circ - 47^\circ - 58^\circ = 75^\circ$ $\frac{AC}{\sin 47} = \frac{220}{\sin 75} (= \frac{AB}{\sin 58})$ $AC = \frac{220 \sin 47}{\sin 75} = 166.57..$ $\text{Area} = \frac{1}{2} \times 220 \times 166.57 \times \sin 58$ $= 15538$	15500 m ²	5	B1 for 75° M1 $\frac{AC}{\sin 47} = \frac{220}{\sin 75} (= \frac{AB}{\sin 58})$ $AC = \frac{220 \sin 47}{\sin 75}$ M1 $\frac{1}{2} \times 220 \times "166.57" \times \sin 58$ A1 15500 m ²
Total for Question: 5 marks					

1MA0/2H				
Question	Working	Answer	Mark	Additional Guidance
18.	<p>Pentagon = 5 equal isos triangles</p> $\frac{360}{5} = 72^\circ$ <p>Base angles = $(180 - 72) \div 2 = 54^\circ$</p> <p>for finding equal sides of isosceles triangle;</p> $\frac{x}{\sin 54} = \frac{10}{\sin 72} =$ <p>8.506508084...</p> <p>area of isosceles triangle =</p> $\frac{1}{2} x^2 \sin 72$ <p>= 34.40954801..</p> <p>area of pentagon</p> <p>= 5×34.40954801</p> <p>= 172.0477401</p> <p>area of dodecahedron</p> <p>= 12×172.0477401</p> <p>OR</p> <p>Using right-angled trigonometry; $h = 5 \tan 54^\circ$</p> <p>= 6.8819...</p> <p>Area of isosceles triangle =</p> $\frac{1}{2} \times 10 \times h$ <p>= 34.40954801...</p> <p>area of pentagon</p> <p>= 5×34.40954801</p> <p>= 172.0477401</p> <p>area of dodecahedron</p> <p>= 12×172.0477401</p>	2065 cm ²	9	<p>B1 for $\frac{360}{5} = 72^\circ$</p> <p>B1 $(180 - 72) \div 2 = 54^\circ$</p> <p>M1 for finding equal sides of isosceles triangle; $x = \frac{x}{\sin 54} = \frac{10}{\sin 72}$</p> <p>A1 for $x = 8.506508084...$</p> <p>M1 for finding area of isosceles triangle = $\frac{1}{2} x^2 \sin 72$</p> <p>A1 for 34.40954801...(ft)</p> <p>B1 for area of pentagon = $5 \times (\text{ft}) = 172.0477401...(\text{ft})$</p> <p>B1 for area of dodecahedron = $12 \times (\text{ft}) = 2064.572881... \text{ cm}^2$</p> <p>A1 for 2065 cm² (oe)</p> <p>OR</p> <p>B1 for $\frac{360}{5} = 72^\circ$</p> <p>B1 $(180 - 72) \div 2 = 54^\circ$</p> <p>M1 for using right-angled trigonometry; $h = 5 \tan 54^\circ$</p> <p>A1 for 6.8819...</p> <p>M1 for finding area of isosceles triangle = $\frac{1}{2} \times 10 \times h$</p> <p>A1 for 34.40954801...(ft)</p> <p>B1 for area of pentagon = $5 \times (\text{ft}) = 172.0477401...(\text{ft})$</p> <p>B1 for area of dodecahedron = $12 \times (\text{ft}) = 2064.572881... \text{ cm}^2$</p> <p>A1 for 2065 cm² (oe)</p>

1MA0/2H				
Question	Working	Answer	Mark	Additional Guidance
18. (Cont)	<p>OR</p> <p>Pentagon split into 3 isos triangles, where 2 are equal. Area of 2 isos triangles $= 2(\frac{1}{2}10^2 \sin 108^\circ)$ $= 95.10565163...$ $\frac{x}{\sin 72^\circ} = \frac{10}{\sin 36^\circ}$ $x = 16.18033989...$ $x^2 = 261.803399..$ Area of 3rd isos triangle $= \frac{1}{2} (261.803399..) \sin 36^\circ$ $= 76.94208845..$</p>	2065 cm ²	9	<p>OR</p> <p>B1 for 108° (and base angles 36°) B1 for base angles 72° (and 36°) M1 for finding equal sides of 3rd isos triangle: $\frac{x}{\sin 72^\circ} = \frac{10}{\sin 36^\circ}$ A1 for $x = 16.18033989...$ M1 for area $= \frac{1}{2} x^2 \sin 36^\circ$ M1 for area $= 2(\frac{1}{2}10^2 \sin 108^\circ)$ A1 for one of (76.94208845.. and 95.10565163...) B1 for area of dodecahedron A1 for 2065 cm² (oe)</p>
Total for Question: 9 marks				



9.

14.

