



Marking Guidance
Delegate Booklet
Summer 2024

1

The graphic for 'Foundation P1' features a large, light blue circle centered on a solid teal background. The text 'Foundation P1' is written in a black, sans-serif font in the center of the circle.

Foundation P1

2

F P1 Q6

6 Ryan buys

4 cakes at £1.30 each
2 identical tins of soup.

Ryan pays with a £10 note.
He gets £1.80 change.

How much does Ryan pay for each tin of soup?

1.30

4x

5.20

+ 1.80

10.00

5.20

5.70

£7 - 10.00 = £3.00

2 ÷ £3.00

= £1.50

1.5(0)

P1 for $4 \times 1.30 (= 5.2(0))$ or $10 - 1.80 (= 8.2(0))$

P1 for $10 - 1.80 - "5.20" (= 3)$ oe

P1 for $"3" \div 2$

A1 cao

SCB2 for answer (£)2.4(0)

Working could be in pence

Condone answer £1.5(0)p

£ 1.50

(Total for Question 6 is 4 marks)

3

F P1 Q6

6 Ryan buys

4 cakes at £1.30 each
2 identical tins of soup.

Ryan pays with a £10 note.
He gets £1.80 change.

How much does Ryan pay for each tin of soup?

1.30, 2.80 3.90 4.20

4x £1.30 = £4.20

4.20 + 1.80 = £6.00

£10 - £6 = £4

£4 ÷ £2 = £2

1.5(0)

P1 for $4 \times 1.30 (= 5.2(0))$ or $10 - 1.80 (= 8.2(0))$

P1 for $10 - 1.80 - "5.20" (= 3)$ oe

P1 for $"3" \div 2$

A1 cao

SCB2 for answer (£)2.4(0)

Working could be in pence

Condone answer £1.5(0)p

£ 2.00

(Total for Question 6 is 4 marks)

4

2

F P1 Q6

6 Ryan buys

4 cakes at £1.30 each
2 identical tins of soup.

Ryan pays with a £10 note.
He gets £1.80 change.

How much does Ryan pay for each tin of soup?

$$\begin{array}{r}
 1.30 \\
 + 1.30 \\
 1.30 \\
 1.30 \\
 \hline
 5.20 \\
 \hline
 1
 \end{array}$$

$$\begin{array}{r}
 5 - 10 = 5 \\
 5 - 20p = 4.80 \\
 \begin{array}{r}
 2.40 \\
 2 \overline{) 4.80} \\
 \hline
 \end{array}
 \end{array}$$

5(0)	P1	for $4 \times 1.30 (= 5.2(0))$ or $10 - 1.80 (= 8.2(0))$	Working could be in pence
	P1	for $10 - 1.80 - "5.20" (= 3)$ oe	
	P1	for " 3 " $\div 2$	
	A1	cao	Condone answer £1.5(0)p
		SCB2 for answer (£)2.4(0)	

£ 2.40

(Total for Question 6 is 4 marks)

5

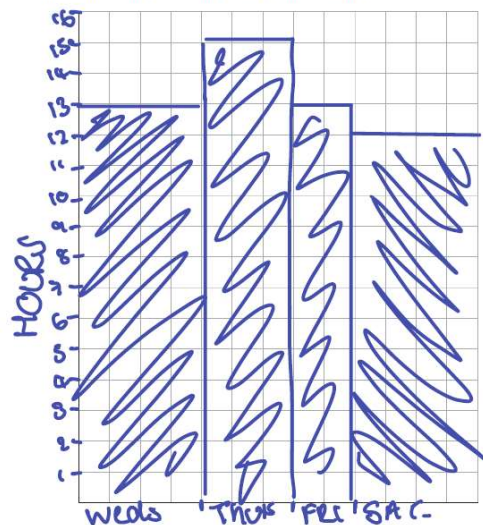
F P1 Q7

7 The table shows the number of hours that Lena and Pavel worked on each of four days last week.

	Wednesday	Thursday	Friday	Saturday
Lena	6	9	8	6
Pavel	7	6	5	6

On the grid, draw a suitable diagram or chart for this information.

Mark	Mark scheme	Additional guidance
M1	for a key, or suitable labels, to identify Lena and Pavel	Accept bar chart, vertical line graph, dual/multiple bar chart, composite bar chart, frequency polygon for all marks. Accept unambiguous abbreviations for labels eg L., P.
M1	for 3 or 4 correct labels for days or a linear scale present	Allow linear scale not starting at 0 Scale must be marked on grid lines.
M1	for a (bar) chart correctly showing data for at least 1 person or 2 days	Bars / lines / points must be unambiguously correct for their scale (scale must be present). Allow for correctly showing total hours worked for all four days on chart (13, 15, 13, 12)
C1	for a fully correct (bar) chart with labels for days of the week, vertical axis correctly scaled and labelled and key/labels for Lena and Pavel	Horizontal axis does not need an overall 'day' label Condone frequency for number of hours. For C mark scale must start at 0 and be linear for the range of values plotted. Condone bars of unequal width Condone no gaps or inconsistent gaps



6

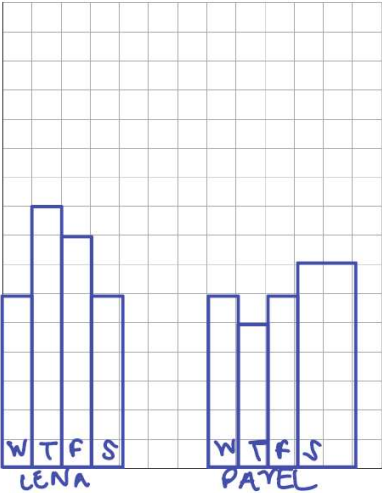
F P1 Q7

Mark	Mark scheme	Additional guidance
M1	for a key, or suitable labels, to identify Lena and Pavel	Accept bar chart, vertical line graph, dual/multiple bar chart, composite bar chart, frequency polygon for all marks.
M1	for 3 or 4 correct labels for days or a linear scale present	Accept unambiguous abbreviations for labels eg L, P
M1	for a (bar) chart correctly showing data for at least 1 person or 2 days	Allow linear scale not starting at 0 Scale must be marked on grid lines.
C1	for a fully correct (bar) chart with labels for days of the week, vertical axis correctly scaled and labelled and key/labels for Lena and Pavel	Bars / lines / points must be unambiguously correct for their scale (scale must be present). Allow for correctly showing total hours worked for all four days on chart (13, 15, 13, 12) Horizontal axis does not need an overall 'day' label Condone frequency for number of hours. For C mark scale must start at 0 and be linear for the range of values plotted. Condone bars of unequal width Condone no gaps or inconsistent gaps

7 The table shows the number of hours that Lena and Pavel worked on each of four days last week.

	Wednesday	Thursday	Friday	Saturday
Lena	6	9	8	6
Pavel	7	6	5	6

On the grid, draw a suitable diagram or chart for this information.



7

F P1 Q9 b

9 Here is a number machine.



(a) Work out the output when the input is 13

(b) Work out the input when the output is 28

$28 - 10 = 18 \div 2 = 9$

9

(2)

(b)	19	M1	starts method to find input using inverse operations eg $28 \div 10 (=38)$ or sight of $+10$ and $\div 2$	$+10$ and $\div 2$ could be seen in a flow diagram Working may be next to number machine.
		A1	cao	

8

F P1 Q10

10 There are 24 cows and 36 sheep on a farm.
Write as a ratio the number of cows to the number of sheep.
Give your ratio in its simplest form.

$$\begin{array}{ccc} 24 & : & 36 \\ \div 12 \swarrow & & \searrow \div 12 \\ 2 & : & 3 \end{array}$$

$2:3$

(Total for Question 10 is 2 marks)

2 : 3	M1	for 24 : 36 oe or 3 : 2 or 1.5 : 1	
	A1	2 : 3 or 1 : 1.5	Do not ISW from 2:3

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9

9

F P1 Q10

10 There are 24 cows and 36 sheep on a farm.
Write as a ratio the number of cows to the number of sheep.
Give your ratio in its simplest form.

$$\begin{array}{ccc} 24 & & 36 \\ \downarrow & & \downarrow \\ 12 & & 18 \\ \downarrow & & \downarrow \\ 6 & & 9 \\ \downarrow & & \\ 3 & & \end{array}$$

$3:9$

(Total for Question 10 is 2 marks)

2 : 3	M1	for 24 : 36 oe or 3 : 2 or 1.5 : 1	
	A1	2 : 3 or 1 : 1.5	Do not ISW from 2:3

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10

10

F P1 Q11 c

(c) Write **one** pair of brackets in this calculation so that the answer is correct.

~~30~~ $30 \div (3 + 2) - 4 = 2$

(1)

(c)	$30 \div (3 + 2) - 4$	B1	for brackets correctly placed
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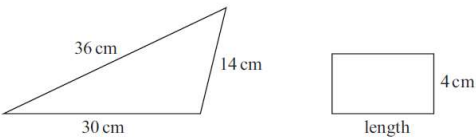
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11

11

F P1 Q12

12 The diagram shows a triangle and a rectangle.



The perimeter of the rectangle is a quarter of the perimeter of the triangle.

Perimeter triangle = $\frac{1}{4}$ of rectangle

$36 + 30 + 14$

①
$$\begin{array}{r} 36 \\ 30 \\ 14 \\ \hline 110 \end{array}$$

②
$$\begin{aligned} 110 \div 2 &= 60 \\ 60 \div 2 &= 30 \\ \text{Perimeter of rectangle} &= 30 \end{aligned}$$

③
$$\begin{aligned} 30 - 4 - 4 &= 22 \\ 22 \div 2 &= 11 \\ \text{length} &= 11 \end{aligned}$$

Answer	Mark	Mark scheme	Additional guidance
6	P1	for process to find perimeter of triangle eg $14 + 30 + 36 (= 80)$	
	P1	for " $80 \div 4 (= 20)$ "	
	P1	for a complete process eg " $(20 - 4 - 4) \div 2$ or " $20 \div 2 - 4$ "	$36 \div 4 + 14 \div 4 + 30 \div 4 (= 20)$ scores P1P1

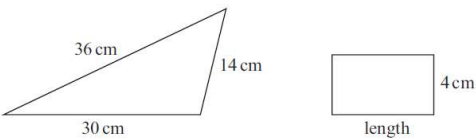
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12

12

F P1 Q12

12 The diagram shows a triangle and a rectangle.



The perimeter of the rectangle is a quarter of the perimeter of the triangle.
Work out the length of the rectangle.

$$\underbrace{36 + 14 + 30}_{\begin{smallmatrix} 66 \\ 70 \\ 80 \end{smallmatrix}} = 80 \div 4 = 20 - 8 = 12 \div 2 = 6 \text{ cm}$$

Answer	Mark	Mark scheme	Additional guidance
6	P1	for process to find perimeter of triangle eg $14 + 30 + 36 (= 80)$	
	P1	for " $80 \div 4 (= 20)$ "	$36 \div 4 + 14 \div 4 + 30 \div 4 (= 20)$ scores P1P1
	P1	for a complete process eg " $(80 - 4 - 4) \div 2$ or " $20 \div 2 = 10$ "	

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13

13

F P1 Q13b

There are only 1p coins and 2p coins in a bag.
The total value of the coins in the bag is 40p.
The total value of the 1p coins is the same as the total value of the 2p coins.
Simon takes at random a coin from the bag.
(b) Find the probability that Simon takes a 1p coin.

$$\begin{array}{lcl} 1\text{p} & = & 20 \text{ coins} \\ 2\text{p} & = & 10 \text{ coins} \\ & + & 30 \text{ coins} \end{array} \qquad \begin{array}{lcl} = & 1 \times 20 & = 20\text{p} \\ & 2 \times 10 & = 20\text{p} \\ & + & 40\text{p} \end{array}$$

$$\frac{20}{30}$$

$\frac{2}{3}$	P1	for start of process to write down proportion of each coin, writes down a correct ratio, eg $1\text{p} : 2\text{p} = 2 : 1$ oe or a process to work out number of 1p coins and 2p coins, eg $40 \div 2 (= 20)$ and $(40 \div 2) \div 2 (= 10)$ or assigns numbers in correct proportion, eg 6 1p coins and 3 2p coins or finding the probability of a 2p coin $(= \frac{1}{3})$	
	A1	for $\frac{2}{3}$ oe	Accept any equivalent fraction, decimal form, 0.66(6...) or 0.67 or percentage form, 66(6...) % or 67 %

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14

14

F P1 Q13b

There are only 1p coins and 2p coins in a bag.
The total value of the coins in the bag is 40p

The total value of the 1p coins is the same as the total value of the 2p coins.

Simon takes at random a coin from the bag.

(b) Find the probability that Simon takes a 1p coin.

10 2p coins
20 1p coins

2:1

$\frac{2}{3}$

P1

for start of process to write down proportion of each coin, writes down a correct ratio, eg 1p : 2p = 2 : 1 oe
or
a process to work out number of 1p coins and 2p coins, eg $40 \div 2 (= 20)$ and $(40 \div 2) \div 2 (= 10)$
or
assigns numbers in correct proportion, eg 6 1p coins and 3 2p coins
or
finding the probability of a 2p coin $(= \frac{1}{3})$

A1

for $\frac{2}{3}$ oe

Accept any equivalent fraction, decimal form, 0.66(6...) or 0.67 or percentage form, 66(6...)%, or 67%

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15

15

F P1 Q16

6 Batteries are sold in packs of 4, in packs of 8 and in packs of 12



£1.80



£3.20



£6.00

A pack of 4 batteries costs £1.80
A pack of 8 batteries costs £3.20
A pack of 12 batteries costs £6.00

5.40 for 12
5 for 12
£6 for 12

Which pack gives the best value for money?
You must show how you get your answer.

4 batteries - 12 batteries = 4×3.80
 $£1.80 \times 3 = £5.40$

A pack of 8 is better for price

Answer	Mark	Mark scheme	Additional guidance																																
Pack of 8 (supported)	P1	for a process (for at least 2 packs) of division of price by quantity eg at least 2 of $180 \div 4 (= 45)$ or $320 \div 8 (= 40)$ or $600 \div 12 (= 50)$ OR any other process that could lead to a comparison of 2 packs eg $180 \div 2 (= 360)$ or $320 \div 8 (= 40)$ and $40 \times 12 (= 480)$	Calculations could be in pounds or in pence <table><tr><th></th><th>4 pack</th><th>8 pack</th><th>12 pack</th></tr><tr><td>1</td><td>0.45</td><td>0.40</td><td>0.50</td></tr><tr><td>2</td><td>0.90</td><td>0.80</td><td>1.00</td></tr><tr><td>4</td><td>1.80</td><td>1.60</td><td>2.00</td></tr><tr><td>8</td><td>3.60</td><td>3.20</td><td>4.00</td></tr><tr><td>12</td><td>5.40</td><td>4.80</td><td>6.00</td></tr><tr><td>16</td><td>7.20</td><td>6.40</td><td>8.00</td></tr><tr><td>24</td><td>10.80</td><td>9.60</td><td>12.00</td></tr></table>		4 pack	8 pack	12 pack	1	0.45	0.40	0.50	2	0.90	0.80	1.00	4	1.80	1.60	2.00	8	3.60	3.20	4.00	12	5.40	4.80	6.00	16	7.20	6.40	8.00	24	10.80	9.60	12.00
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	P1	for a complete process to give values that can be used for comparison of all 3 packs eg $180 \div 4 (= 45)$ and $320 \div 8 (= 40)$ and $600 \div 12 (= 50)$ OR $3.20 \div 8 (= 0.40)$ and $0.40 \times 4 (= 1.60)$ and $0.40 \times 12 (= 4.80)$ OR $1.80 \div 6 (= 10.80)$ and $3.20 \div 3 (= 9.60)$ and $6.00 \div 2 (= 12.00)$	Condone incorrect units. Pairwise comparison is possible, but check to see that this allows for a decision to be made. Check process. Assuming correct figures found: <table><tr><th>Comparisons</th><th>Conclusion possible</th></tr><tr><td>4 vs 8</td><td>8 vs 12</td><td>Yes</td></tr><tr><td>4 vs 8</td><td>4 vs 12</td><td>Yes</td></tr><tr><td>4 vs 12</td><td>8 vs 12</td><td>No</td></tr></table>	Comparisons	Conclusion possible	4 vs 8	8 vs 12	Yes	4 vs 8	4 vs 12	Yes	4 vs 12	8 vs 12	No																					
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4 vs 8	8 vs 12	Yes																																	
4 vs 8	4 vs 12	Yes																																	
4 vs 12	8 vs 12	No																																	
	A1	for 'pack of 8' and correct values that can be used to compare all 3 packs	Correct answer with no supportive working scores 0 marks. Do not allow A mark where inconsistent units would prevent comparison e.g. 0.40p and 45p																																

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16

16

F P1 Q16

6 Batteries are sold in packs of 4, in packs of 8 and in packs of 12



£1.80



£3.20



£6.00

A pack of 4 batteries costs £1.80
A pack of 8 batteries costs £3.20
A pack of 12 batteries costs £6.00

Which pack gives the best value for money?
You must show how you get your answer.

Pack of 8 + pack of 4 = £5
12 = £6.00
4 packs x 3 = £5.40
Pack of 8 + pack of 4 = £5.00

Answer	Mark	Mark scheme	Additional guidance																																
Pack of 8 (supported)	P1	for a process (for at least 2 packs) of division of price by quantity eg at least 2 of $180 \div 4 (= 45)$ or $320 \div 8 (= 40)$ or $600 \div 12 (= 50)$ OR any other process that could lead to a comparison of 2 packs eg $180 \times 2 (= 360)$ or $320 \div 8 (= 40)$ and $40 \times 12 (= 480)$	Calculations could be in pounds or in pence <table><tr><th></th><th>4 pack</th><th>8 pack</th><th>12 pack</th></tr><tr><td>1</td><td>0.45</td><td>0.40</td><td>0.50</td></tr><tr><td>2</td><td>0.90</td><td>0.80</td><td>1.00</td></tr><tr><td>4</td><td>1.80</td><td>1.60</td><td>2.00</td></tr><tr><td>8</td><td>3.60</td><td>3.20</td><td>4.00</td></tr><tr><td>12</td><td>5.40</td><td>4.80</td><td>6.00</td></tr><tr><td>16</td><td>7.20</td><td>6.40</td><td>8.00</td></tr><tr><td>24</td><td>10.80</td><td>9.60</td><td>12.00</td></tr></table>		4 pack	8 pack	12 pack	1	0.45	0.40	0.50	2	0.90	0.80	1.00	4	1.80	1.60	2.00	8	3.60	3.20	4.00	12	5.40	4.80	6.00	16	7.20	6.40	8.00	24	10.80	9.60	12.00
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	A1	for 'pack of 8' and correct values that can be used to compare all 3 packs	Correct answer with no supportive working scores 0 marks. Do not allow A mark where inconsistent units would prevent comparison e.g. 0.40p and 45p																																

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17

17

F P1 Q17

17 Solve $2(4x - 5) = 18$

$$\begin{aligned} 2(4x - 5) &= 18 \\ 8x + 10 &= 18 \\ -10 &\quad -10 \\ 8x &= 8 \\ \div 8 &\quad \div 8 \\ x &= 1 \end{aligned}$$

Answer	Mark	Mark scheme	Additional guidance
3.5	M1	for correct expansion of brackets, ie $8x - 10$ or dividing throughout by 2 as a first step to solve equation, eg $4x - 5 = 9$	For M marks step must be carried out not just intention shown. For example, if you see $2(4x - 5) = 18$ $\div 2 \quad \div 2$ Award M1 for: $4x - 5 = k$ with $k \neq 18, 36$
	M1	for isolating terms in x, eg $8x = 18 + 10$ or $4x = 9 + 5$	fit their equation of the form $ax \pm b = c$ For example, if you see $8x - 10 = 18$ $+10 \quad +10$ Award M1 for: $8x = k$ with $k \neq 8, 18$
	A1	for 3.5 or $3\frac{1}{2}$ or $\frac{7}{2}$ or $\frac{7}{2}$	

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18

18

F P1 Q17

17 Solve $2(4x - 5) = 18$

$$\begin{array}{r} 18 \\ 10 \\ \hline 28 \end{array}$$

$$\begin{aligned} 8x - 10 &= 18 \\ 8x &= 18 + 10 \\ 8x &= 28 \\ x &= \frac{28}{8} \\ x &= 4 \end{aligned}$$

Answer	Mark	Mark scheme	Additional guidance
3.5	M1	for correct expansion of brackets, ie $8x - 10$ or dividing throughout by 2 as a first step to solve equation, eg $4x - 5 = 9$	For M marks step must be carried out not just intention shown. For example, if you see $2(4x - 5) = 18$ $\div 2 \qquad \div 2$ Award M1 for: $4x - 5 = k$ with $k \neq 18, 36$
	M1	for isolating terms in x, eg $8x = 18 + 10$ or $4x = 9 + 5$	ft their equation of the form $ax \pm b = c$ For example, if you see $8x - 10 = 18$ $+10 \qquad +10$ Award M1 for: $8x = k$ with $k \neq 8, 18$
	A1	for 3.5 or $3\frac{1}{2}$ oe or $\frac{7}{2}$ oe	

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19

19

F P1 Q28

28 Solve $x + 11 \leq 5 - \frac{1}{2}x$

↑
more than

$$\begin{aligned} x + 11 &\leq 5 - 0.5x \\ -5 \qquad -5 \\ x + 6 &\leq 0.5x \\ \times 2 \qquad \times 2 \\ x + 12 &\leq x \\ 12 &\leq x \end{aligned}$$

Answer	Mark	Mark scheme	Additional guidance
$x \leq -4$	M1	for a correct first step working with an equation or inequality eg $x + 11 - 11 \leq 5 - \frac{1}{2}x - 11$ or $x + 11 + \frac{1}{2}x \leq 5 - \frac{1}{2}x + \frac{1}{2}x$ or $2 \times x + 2 \times 11 \leq 2 \times 5 - 2 \times \frac{1}{2}x$	Can work with an equation or incorrect inequality symbol for both M marks Allow for subtracting 5 from both sides or subtracting x from both sides. For M marks step must be carried out not just intention shown. For example, if you see $x + 11 \leq 5 - \frac{1}{2}x$ $-11 \qquad -11$ Award M1 for: $x \leq k - \frac{1}{2}x$ with $k \neq 5, k \neq 16$ or indicating $+\frac{1}{2}x$ reaching $kx + 11 \leq 5$ with $k \neq \frac{1}{2}, k \neq 1$ or indicating multiplying by 2 obtaining an equation or inequality with three of four terms correct and no term unchanged.
	M1	for a full method to solve the inequality or for a critical value of -4	Award 2 marks for answer of $x \geq -4$ where \geq is an $=$ or any incorrect inequality symbol, or for answer shown as just -4
	A1	for $x \leq -4$ oe as final answer	

(Total for Question 28 is 3 marks)

20

Foundation / Higher
Crossover
P1

21

F P1 Q20
H P1 Q1

20 Here are the first four terms of an arithmetic sequence.

145913

4444

Find an expression, in terms of n , for the n th term of this sequence.

$n+4$

$4n+4$

$n+4$

$4n-3$	B2	for $4n-3$ oe	Accept a different variable eg $4x-3$ Accept $u_n = 4n-3, T = 4n-3$ etc
	(B1	for $4n+k$ where $k \neq -3$ or is absent unambiguously shown)	$n = 4n-3$ or $4n^{\text{th}}-3$ gets B1 only

22

F P1 Q20
H P1 Q1

20 Here are the first four terms of an arithmetic sequence.

$$1 \quad 5 \quad 9 \quad 13$$

Find an expression, in terms of n , for the n th term of this sequence.

$$4n + 1$$

$$\underline{4n + 1}$$

$4n - 3$	B2	for $4n - 3$ oe	Accept a different variable eg $4x - 3$ Accept $u_n = 4n - 3$, $T = 4n - 3$ etc
	(B1	for $4n + k$ where $k \neq -3$ or is absent unambiguously shown)	$n = 4n - 3$ or $4n^{\text{th}} - 3$ gets B1 only

23

F P1 Q20a
H P1 Q1a

2 (a) Work out $3\frac{4}{5} - 1\frac{2}{3}$

$$\frac{19}{5} - \frac{5}{3}$$

$$\frac{57}{15} - \frac{25}{15}$$

$$= \frac{32}{15}$$

Answer	Mark	Mark scheme	Additional guidance
$2\frac{2}{15}$	M1	for a method to subtract using a common denominator with at least one fraction correct (suitable common denominator for original fractions with at least one correct numerator) eg $\frac{57}{15} - \frac{25}{15}$ or $(3)\frac{12}{15} - (1)\frac{10}{15}$	Use of decimals gets no credit unless it leads to a correct fraction (2)
	A1	for $2\frac{2}{15}$ oe eg $\frac{32}{15}$	ISW incorrect conversion from improper fraction to mixed number or incorrect simplification of improper fraction

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24

24

F P1 Q20a
H P1 Q1a

2 (a) Work out $3\frac{4}{5} - 1\frac{2}{3}$

$$\frac{19}{5} - \frac{5}{3}$$

$$\frac{57}{15} - \frac{25}{15} = \frac{32}{15}$$

$$= 2\frac{7}{15}$$

Answer	Mark	Mark scheme	Additional guidance
$2\frac{2}{15}$	M1	for a method to subtract using a common denominator with at least one fraction correct (suitable common denominator for original fractions with at least one correct numerator) eg $\frac{57}{15} - \frac{25}{15}$ or $(3)\frac{12}{15} - (1)\frac{10}{15}$	Use of decimals gets no credit unless it leads to a correct fraction (2)
	A1	for $2\frac{2}{15}$ oe eg $\frac{32}{15}$	ISW incorrect conversion from improper fraction to mixed number or incorrect simplification of improper fraction

25

F P1 Q24
H P1 Q5

Sophie drives a distance of 513 kilometres on a motorway in France. She pays 0.81 euros for every 10 kilometres she drives.

(a) Work out an estimate for the total amount that Sophie pays.

$$513 \div 10 = 51.3$$

$$51.3 \times 0.81 = \text{euros paid}$$

$$\downarrow$$

$$51 \times 1 = 51$$

51 euros (3)

(b) Is your answer to part (a) an underestimate or an overestimate? Give a reason for your answer.

An overestimate as I rounded 0.81 to 1 euro, meaning it's greater than the actual price paid.

(a)	Estimated value	P1	for using a value rounded to 1sf in a calculation eg $500 \div 10$ or 500×0.8 or $510 \div 0.8$ or $513 \div 0.8$ or 500×0.81	Their rounded value must be used in a calculation Rounding may occur after a correct process, eg $513 \div 10 = 51.3 \approx 50$ and 50×0.81 $513 \div 10 = 51.3 \approx 51$ and 51×0.81 scores P1P1 Accept 0.81 rounded to 0.80 for this mark Condone 0.81 rounded to 1 for this mark
		P1	for a full process to find the total amount eg $500 \div 10 \times 0.8$ oe $(=40)$ or $510 \div 10 \times 0.8$ oe $(=40.8)$ or $500 \div 10 \times 0.81$ ($=40.5$) or $[\text{distance}] \div 10 \times [\text{amount}]$ oe	Where $[\text{distance}]$ is their rounded 513 or 513 and $[\text{amount}]$ is their rounded 0.81 or 0.81 Accept $513 \div 10 \times 0.81$ for this mark
		A1	for a correct answer following through their correct rounded value(s)	Do not award this mark if 0.81 is rounded to 1
(b)	underestimate with reason	C1	fit from (a) eg underestimate as numbers rounded down	Must relate to estimation and not rounding of their final answer and they must have a final answer to part (a)

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F P1 Q24
H P1 Q5

Sophie drives a distance of 513 kilometres on a motorway in France. She pays 0.81 euros for every 10 kilometres she drives.

(a) Work out an estimate for the total amount that Sophie pays.

$513 \div 10$
 51.3
 $500 \div 10 = 50$
 $0.81 \approx 1$
 $50 \times 1 = 50$
 50 euros
(3)

(b) Is your answer to part (a) an underestimate or an overestimate? Give a reason for your answer.

underestimate, rounded 513 down to 500

(a)	Estimated value	P1	for using a value rounded to 1sf in a calculation eg $500 \div 10$ or 500×0.8 or $510 \div 0.8$ or $513 \div 0.8$ or 500×0.81	Their rounded value must be used in a calculation Rounding may occur after a correct process, eg $513 \div 10 = 51.3 \approx 50$ and 50×0.81 $513 \div 10 = 51.3 \approx 51$ and 51×0.8 scores P1P1 Accept 0.81 rounded to 0.80 for this mark Condone 0.81 rounded to 1 for this mark Where [distance] is their rounded 513 or 513 and [amount] is their rounded 0.81 or 0.81 Accept $513 \div 10 \times 0.81$ for this mark
		P1	for a full process to find the total amount eg $500 \div 10 \times 0.8$ oe (≈ 40) or $510 \div 10 \times 0.8$ oe (≈ 40.8) or $500 \div 10 \times 0.81$ (≈ 40.5) or [distance] $\div 10 \times$ [amount] oe	
		A1	for a correct answer following through their correct rounded value(s)	Do not award this mark if 0.81 is rounded to 1
(b)	underestimate with reason	C1	ft from (a) eg underestimate as numbers rounded down	Must relate to estimation and not rounding of their final answer and they must have a final answer to part (a)

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Higher P1

28

14

H P1 Q8

Len has 8 parcels.
The mean weight of the 8 parcels is 2.5 kg.
The mean weight of 3 of the parcels is 2 kg.
Work out the mean weight of the other 5 parcels.

$2.5 \times 8 = 20.0$
 $3 \times 2 = 6 = \text{weight of 3}$
 $20 - 6 = 14$
 $14 \div 5 = 2.8$
 2.8 kg

Answer	Mark	Mark scheme
2.8	M1	for $8 \times 2.5 (= 20)$ or $3 \times 2 (= 6)$
	M1	for a complete method eg $(“20” - “6”) \div 5$
	A1	for 2.8 or $2\frac{4}{5}$ or mixed number

H P1 Q8

Len has 8 parcels.
The mean weight of the 8 parcels is 2.5 kg.
The mean weight of 3 of the parcels is 2 kg.
Work out the mean weight of the other 5 parcels.

$8 \times 2.5 = 20$
 $3 \times 2 = 6$
 $20 - 6 = 14$
 $2 + 0.8 = 2.8$
 $\frac{14}{5} = 2\frac{4}{5}$
 $\frac{4}{5} = 0.8$
 2.8

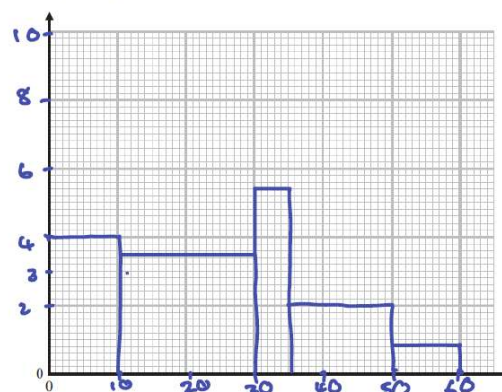
Answer	Mark	Mark scheme
2.8	M1	for $8 \times 2.5 (= 20)$ or $3 \times 2 (= 6)$
	M1	for a complete method eg $(“20” - “6”) \div 5$
	A1	for 2.8 or $2\frac{4}{5}$ or mixed number

H P1 Q13a

13 The table gives information about the amount of time that each of 150 people were in a shop.

Time (t minutes)	Frequency	F. D.
$0 < t \leq 10$	20	4
$10 < t \leq 30$	70	3.5
$30 < t \leq 35$	22	5.4
$35 < t \leq 50$	30	2
$50 < t \leq 60$	8	0.8

(a) On the grid, draw a histogram for this information.



Question	Answer	Mark	Mark scheme	Additional guidance
(a)	Histogram drawn	B3	for fully correct histogram with axes scaled and labelled	Relative heights 2, 3.5, 4.4, 2, 0.8

31

31

H P1 Q14

Expand and simplify $(3x - 1)(2x + 3)(x - 5)$

$$\begin{aligned}
 &(3x - 1)(2x + 3) \\
 &6x^2 + 9x - 2x - 3 \\
 &(6x^2 + 7x - 3)(x - 5) \\
 &6x^3 + 7x^2 - 30x^2 - 35x + 15 \\
 &6x^3 - 23x^2 - 35x + 15
 \end{aligned}$$

$6x^3 - 23x^2 - 35x + 15$	M1	for method to find the product of any two linear expressions (3 out of 4 terms correct or 4 correct terms ignoring signs) eg $6x^2 + 9x - 2x - 3$ or $3x^2 - 15x - x + 5$ or $2x^2 - 10x + 3x - 15$	Note that, for example, $7x - 3$ in expansion of $(3x - 1)(2x + 3)$ is regarded as 3 correct terms Do not award this mark for eg $6x^2 + 9x - 2x - 3 + 3x^2 - 15x - x + 5$
	M1	for a complete method to obtain all terms, half of which are correct (ft their first product) eg $6x^3 + 7x^2 - 30x^2 - 35x - 3x + 15$ or $6x^3 + 9x^2 - 32x^2 - 48x + 10x + 15$ or $6x^3 - 2x^2 - 21x^2 - 45x + 7x + 15$	First product must be quadratic with at least 3 terms but need not be simplified or may be simplified incorrectly
	A1	cao	

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H P1 Q14

Expand and simplify $(3x - 1)(2x + 3)(x - 5)$

$$5x^2 + 9x - 2x - 3 = 5x^2 + 7x - 3$$

	$5x^2$	$7x$	-3
x	$5x^3$	$7x^2$	$-3x$
-5	$-25x^2$	$-35x$	-15

$$5x^2 + 7x^2 - 25x^2 - 3x - 35x - 15$$

$$= 5x^2 - 18x^2 - 38x - 15$$

$6x^3 - 23x^2 - 38x + 15$	M1	for method to find the product of any two linear expressions (3 out of 4 terms correct or 4 correct terms ignoring signs) eg $6x^2 + 9x - 2x - 3$ or $3x^2 - 15x - x + 5$ or $2x^2 - 10x + 3x - 15$	Note that, for example, $7x - 3$ in expansion of $(3x - 1)(2x + 3)$ is regarded as 3 correct terms Do not award this mark for eg $6x^2 + 9x - 2x - 3 + 3x^2 - 15x - x + 5$
	M1	for a complete method to obtain all terms, half of which are correct (ft their first product) eg $6x^3 + 7x^2 - 30x^2 - 35x - 3x + 15$ or $6x^3 + 9x^2 - 32x^2 - 48x + 10x + 15$ or $6x^3 - 2x^2 - 21x^2 - 45x + 7x + 15$	First product must be quadratic with at least 3 terms but need not be simplified or may be simplified incorrectly
	A1	cao	

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H P1 Q17 a

(a) Rationalise the denominator of $\frac{1}{\sqrt{7}}$

$$\frac{1}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}}$$

$$= \frac{\sqrt{7}}{7}$$

(a)	$\frac{\sqrt{7}}{7}$	B1	for $\frac{\sqrt{7}}{7}$ or $\frac{k\sqrt{7}}{7k}$ or $\frac{\sqrt{7k^2}}{7k}$ where k is an integer not equal to 0
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H P1 Q17 b

(b) Simplify fully $\sqrt{80} - \sqrt{5}$

$$\begin{aligned} \sqrt{80} &= 2\sqrt{20} \\ \begin{array}{r} 80\ 1 \\ 40\ 2 \\ 20\ 4 \end{array} & \quad 2\sqrt{20} - \sqrt{5} \\ &= 2\sqrt{15} \end{aligned}$$

$2\sqrt{15}$

(b)	$3\sqrt{5}$	M1	for writing $\sqrt{80}$ as $\sqrt{16 \times 5}$ or $\sqrt{16} \times \sqrt{5}$ or $4\sqrt{5}$
		A1	for $3\sqrt{5}$ or $\sqrt{45}$

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H P1 Q18

Show that $0.\dot{1}5 + 0.\dot{2}7$ can be written in the form $\frac{m}{66}$ where m is an integer.

$$\begin{aligned} x &= 0.15151515 \\ 100x &= 15.151515 \\ 99x &= 15 \end{aligned} \qquad \begin{aligned} x &= 0.2272727 \\ 1000x &= 227.2727 \\ &\quad 0.2272 \\ 999x &= 227.0455 \end{aligned}$$

Mark	Mark scheme	Additional guidance
M1	for $0.1515... + 0.22727... (= 0.37878... \text{ or } 0.37\bar{8})$	
M1	for finding two correct recurring decimals that when subtracted would result in a terminating decimal or integer, eg $(1000x - 10x) \Rightarrow 378.7878... - 3.7878... (= 375)$ or $\frac{375}{990}$ or $(100x - x) \Rightarrow 37.8787... - 0.37878... (= 37.5)$ or $\frac{37.5}{99}$	Recurring decimal notation acceptable for this mark
C1	for correct working leading to $\frac{25}{66}$	
OR		
M1	for start of a method to convert $0.1515... \text{ or } 0.22727... \text{ to a fraction, eg } 100x = 15.1515... \text{ or } \frac{15}{99} \text{ or } \frac{5}{33} \text{ oe or } 10y = 2.2727... \text{ or } 100y = 22.7272... \text{ or } 1000y = 227.2727... or } \frac{225}{990} \text{ or } \frac{22.5}{99} \text{ or } \frac{5}{22} \text{ oe}$	Recurring decimal notation acceptable for both M marks
M1	for a method to convert $0.1515... \text{ and } 0.22727... \text{ to fractions, eg } (100x - x) \Rightarrow 15.1515... - 0.1515... (= 15)$ or $\frac{15}{99} \text{ or } \frac{5}{33} \text{ oe and } (1000y - 10y) \Rightarrow 227.2727... - 2.2727... (= 225)$ or $(1000y - y) \Rightarrow 227.2727... - 0.22727... (= 227)$ or $\frac{225}{990} \text{ or } \frac{22.5}{99} \text{ or } \frac{5}{22} \text{ oe}$	
C1	for correct working leading to $\frac{25}{66}$	

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HP1 Q18

Show that $0.\dot{1}\dot{5} + 0.2\dot{2}\dot{7}$ can be written in the form $\frac{m}{66}$ where m is an integer.

Mark	Mark scheme	Additional guidance
M1	for $0.1515... + 0.22727... (= 0.37878... \text{ or } 0.3\overline{78})$	
M1	for finding two correct recurring decimals that when subtracted would result in a terminating decimal or integer. eg $(1000x - 10x =) 378.7878... - 3.7878... (= 375)$ or $\frac{375}{990}$ or $(100x - x =) 37.8787... - 0.37878... (= 37.5)$ or $\frac{37.5}{99}$	Recurring decimal notation acceptable for this mark
C1	for correct working leading to $\frac{25}{66}$	
OR		
M1	for start of a method to convert $0.1515... \text{ or } 0.22727...$ to a fraction. eg $100x = 15.1515... \text{ or } \frac{15}{99} \text{ or } \frac{5}{33}$ oe or $10y = 2.2727... \text{ or } 100y = 22.7272... \text{ or } 1000y = 227.2727...$ or $\frac{225}{990}$ or $\frac{22.5}{99}$ or $\frac{5}{22}$ oe	Recurring decimal notation acceptable for both M marks
M1	for a method to convert $0.1515... \text{ and } 0.22727...$ to fractions. eg $(1000x - x =) 15.1515... - 0.1515... (= 15)$ or $\frac{15}{99}$ or $\frac{5}{33}$ oe and $(1000y - 10y =) 227.2727... - 2.2727... (= 225)$ or $(1000y - y =) 227.2727... - 0.22727... (= 225)$ or $\frac{225}{990}$ or $\frac{22.5}{99}$ or $\frac{5}{22}$ oe	
C1	for correct working leading to $\frac{25}{66}$	

$0.\dot{1}\dot{5} = x$
 $15.\dot{1}\dot{5} = 100x$
 $15 = 99x = \frac{15}{99} = \frac{5}{33}$

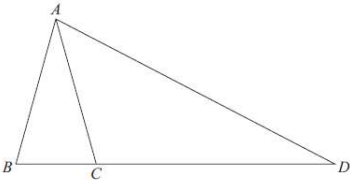
$0.2\dot{2}\dot{7} = x$
 $22.7\dot{2}\dot{7} = 100x$
 $99x = 22.5 = \frac{22.5}{99} = \frac{7.5}{33}$

$\frac{5}{33} + \frac{7.5}{33} = \frac{12.5}{33} \quad m = 12.5$

37

HP1 Q19

19

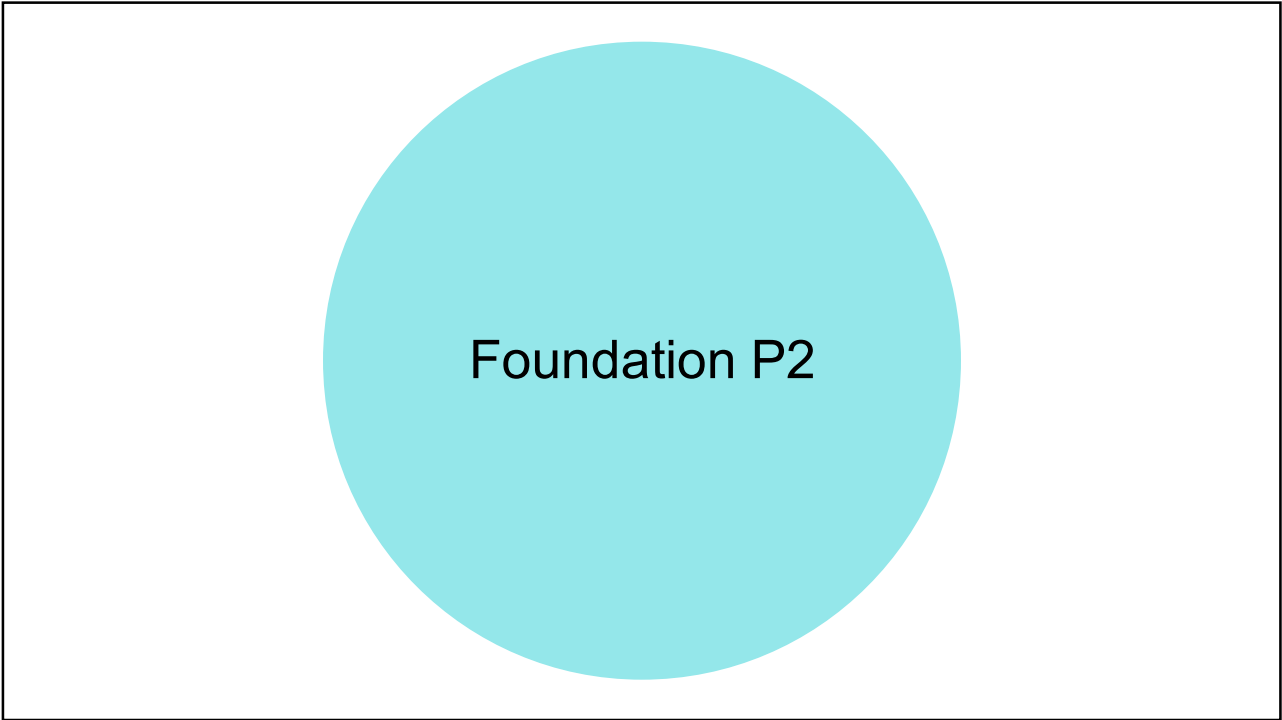


ABC and DAB are similar isosceles triangles.
 $AB = AC$
 $AD = BD$
 $BC : CD = 4 : 21$
Find the ratio $AB : AD$

2.5

Question	Mark	Mark scheme	Additional guidance
2 : 5	P1	for using similar triangles to form an equation eg $\frac{AB}{BC} = \frac{AD}{AB}$ oe or $\frac{AB}{4} = \frac{25}{AB}$ oe or $\frac{AB}{4k} = \frac{25k}{AB}$ oe or $AB : 4 = 25 : AB$ oe or $BC \times sf = BD \div sf$ oe or $4 \times sf = 25 \div sf$ oe or for working with the perpendicular height of triangle ABC eg $(h^2 =) 25^2 - 23^2 (= 96)$ or $(h =) \sqrt{25^2 - 23^2} (= \sqrt{96})$	May use x or any other letter for AB
	P1	for process to find AB eg $(AB =) \sqrt{4 \times 25} (= 10)$ oe or $\sqrt{96 + 2^2} (= 10)$ or for process to find the scale factor eg $\sqrt{\frac{25}{4}} (= \frac{5}{2})$ oe	Accept $AB = 4 \times sf, AB = 25 \div sf$
	A1	oe	

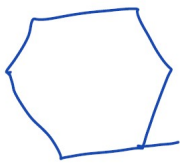

38



39

F P2 Q7c

(c) In the space below, draw a hexagon.



(c)	6-sided shape	B1	for a 6-sided shape	Allow free hand drawing	40
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40

F P2 Q9

- 9 Anil has a job as a driver.
He is paid for each mile he drives.
He is also paid expenses.

One week Anil writes down the distance readings from his car.

Start of week:	4	7	2	4	1	miles
End of week:	4	7	8	7	9	miles

For this week, Anil is paid 47p for each mile he drives.
He is also paid expenses of £80

Work out the total amount that Anil is paid.
Give your answer in pounds.

$$4 - 4 = 0$$

$$7 - 7 = 0$$

$$8 - 2 = 6$$

$$7 - 4 = 3$$

$$9 - 1 = 8$$

$$6 + 3 + 8 = 17$$

$$0.47 \times 17 = 7.99$$

$$7.99 + 80$$

$$= 87.99$$

379.86	P1	for process to work with number of miles or cost, eg $47879 - 47241 (= 638)$ or $47879 \times 47 (= 2250313)$ or $47241 \times 47 (= 2220327)$ or [mileage] $\times 47$	working may be seen in £ or pence throughout [mileage] is any value they consider to be mileage
	P1	for process to work with miles and cost, eg " $638" \times 47 (= 29986)$ or " $638" \times 0.47 (= 299.86)$ or " $2250313" - "2220327" (= 29986)$	
	B1	(indep) for converting between pence and pounds, eg " $29986" \div 100$ or $47 \div 100 (= 0.47)$ or 80×100 OR miles divided by 100, eg " $638" \div 100 (= 6.38)$ or $47879 \div 100 (= 478.79)$ and $47241 \div 100 (= 472.41)$	
	A1	for 379.86	

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F P2 Q9

- 9 Anil has a job as a driver.
He is paid for each mile he drives.
He is also paid expenses.

One week Anil writes down the distance readings from his car.

Start of week:	4	7	2	4	1	miles
End of week:	4	7	8	7	9	miles

For this week, Anil is paid 47p for each mile he drives.
He is also paid expenses of £80

Work out the total amount that Anil is paid.
Give your answer in pounds.

458 miles

$$\begin{array}{r} 47241 \\ - 47879 \\ \hline 458 \end{array}$$

$$458 \times 0.47 = 215.26$$

$$215.26 + 80 = \text{£}295.26$$

379.86	P1	for process to work with number of miles or cost, eg $47879 - 47241 (= 638)$ or $47879 \times 47 (= 2250313)$ or $47241 \times 47 (= 2220327)$ or [mileage] $\times 47$	working may be seen in £ or pence throughout [mileage] is any value they consider to be mileage
	P1	for process to work with miles and cost, eg " $638" \times 47 (= 29986)$ or " $638" \times 0.47 (= 299.86)$ or " $2250313" - "2220327" (= 29986)$	
	B1	(indep) for converting between pence and pounds, eg " $29986" \div 100$ or $47 \div 100 (= 0.47)$ or 80×100 OR miles divided by 100, eg " $638" \div 100 (= 6.38)$ or $47879 \div 100 (= 478.79)$ and $47241 \div 100 (= 472.41)$	
	A1	for 379.86	

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F P2 Q9

9 Anil has a job as a driver.
He is paid for each mile he drives.
He is also paid expenses.
One week Anil writes down the distance readings from his car.

Start of week:	4	7	2	4	1	miles
End of week:	4	7	8	7	9	miles

For this week, Anil is paid 47p for each mile he drives.
He is also paid expenses of £80
Work out the total amount that Anil is paid.
Give your answer in pounds.

Handwritten calculations:

$$\begin{aligned} 8 \times 0.47 &= 3.76 \\ 14 \times 0.47 &= 6.58 \\ 10 \times 0.47 &= 4.7 \\ 11 \times 0.47 &= 5.17 \\ 10 \times 0.47 &= 4.7 \\ \hline &24.91 \\ 24.91 + 80 &= 104.91 \end{aligned}$$

379.86	P1	for process to work with number of miles or cost, eg 47879 – 47241 (= 638) or 47879 × 47 (= 2250313) or 47241 × 47 (= 2220327) or [mileage] × 47	working may be seen in £ or pence throughout [mileage] is any value they consider to be mileage
	P1	for process to work with miles and cost, eg “638” × 47 (= 29986) or “638” × 0.47 (= 299.86) or “2250313” – “2220327” (= 29986)	
	B1	(indep) for converting between pence and pounds, eg “29986” ÷ 100 or 47 ÷ 100 (= 0.47) or 80 × 100 OR miles divided by 100, eg “638” ÷ 100 (= 6.38) or 47879 ÷ 100 (= 478.79) and 47241 ÷ 100 (= 472.41)	
	A1	for 379.86	

F P2 Q10

10 Anita throws a coin 3 times.
Each time the coin can land on heads (H) or tails (T).
List all the possible outcomes.

Handwritten list of outcomes:

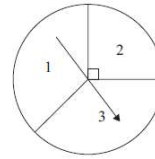
H T T T T H H H
H H T T H H T T
H H H T T T T H

(Total for Question 10 is 2 marks)

HHH, HHT, HTH, HTT, THH, THT, TTH, TTT	M1	for at least 3 correct outcomes from HHH, HHT, HTH, HTT, THH, THT, TTH, TTT ignoring extras and repeats	May be written in words
	A1	for all 8 outcomes with no extras or repeats	

F P2 Q11

11 Majid has a spinner.



Majid is going to spin the arrow.
The arrow can land on 1 or on 2 or on 3

Majid says,

"The probability that the arrow will land on 2 is $\frac{1}{3}$ because the spinner has three sections."

Is Majid correct?

You must give a reason for your answer.

he is kinda right. Yes, it has 3 sections but the sections aren't equal

Answer	Mark	Mark scheme
No with reason	C1	<p>No with reason</p> <p>Acceptable reasons:</p> <p>(The sections are) not the same size or the angles are not the same (The arrow is) more likely to land on 1 or 3 than on 2 (The probability for) 2 should be $\frac{1}{4}$ 2 has a 90° angle but 1 and 3 both have obtuse angles or 135° each 2 has a 90° angle but the others are bigger 2 has a smaller area (the sections have) different sizes/angles/areas (the spinner is) not split equally (the angle for) 2 would be 120 not 90 (The angle for) 2 would be 120 or all angles would be 120 (landing on) 2 is less than a third the chances for the other two are higher than (for) 2</p> <p>Not acceptable:</p> <p>Yes with any reason given No it should be $\frac{2}{3}$ (No because) 2 has a 90° angle the bigger the angle the more likely</p>

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F P2 Q12

2 Saira buys 24 bars of chocolate.

$\frac{2}{3}$ of the 24 bars are white chocolate.

The rest of the 24 bars are milk chocolate.

Each milk chocolate bar has a weight of 35 grams.

Work out the total weight of the milk chocolate bars that Saira buys.

$$\frac{2}{3} = 0.6 \quad 24 \times 0.6 = 14$$

$$\text{white} = 14$$

$$\text{milk} = 10$$

$$10 \times 35 = 350\text{g}$$

280	P1	for process to find the number of bars of white chocolate or milk chocolate, eg $24 \div 3 \times 2$ oe ($= 16$) or $24 \div 3$ ($= 8$) or for process to work with total weight of chocolate, eg 24×35 ($= 840$)	Allow use of 0.66... or better or 0.33... or better for both process marks
	P1	for complete process, eg $(24 - "16") \times 35$ or " 8 " $\times 35$ or " 840 " $\div 3$	Award P2 for an answer of 560
	A1	cao	

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F P2 Q12

2 Saira buys 24 bars of chocolate.

$\frac{2}{3}$ of the 24 bars are white chocolate.

The rest of the 24 bars are milk chocolate.

Each milk chocolate bar has a weight of 35 grams.

Work out the total weight of the milk chocolate bars that Saira buys.

$$2 \overline{) 24}$$

$$\begin{array}{r} 12 \\ \times 35 \\ \hline 60 \\ 360 \\ \hline 420 \end{array}$$

420g

280	P1	for process to find the number of bars of white chocolate or milk chocolate, eg $24 \div 3 \times 2$ oe ($= 16$) or $24 \div 3$ ($= 8$) or for process to work with total weight of chocolate, eg 24×35 ($= 840$)	Allow use of 0.66.. or better or 0.33.. or better for both process marks
	P1	for complete process, eg $(24 - "16") \times 35$ or " 8 " $\times 35$ or " 840 " $\div 3$	Award P2 for an answer of 560
	A1	cao	

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F P2 Q13b

$T = x + 2y$

$x = 3$ and $y = -4$

(b) Work out the value of T .

$$-4 \times 2 = -8$$

$$3 + -8 = -5$$

$T = \dots\dots\dots$

b)	- 5	M1	for $3 + 2 \times -4$ ($= 3 - 8$)
		A1	cao

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F P2 Q14a

14 On Monday, Lizzie cycled 36 kilometres in 3 hours.

(a) Work out Lizzie's average speed.

$$36 \div 3 = 12$$

$$36 \times 3 = 108$$

108

kilometres per hour

12	M1	for method to find speed, eg $36 \div 3$ or $\frac{36}{3}$	Condone $36 \div (3 \times 60)$
	A1	cao	

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F P2 Q15

15 £3500 is invested in a bank for 6 years.

The bank pays **simple** interest at a rate of 2.5% per year.

Work out the total amount of simple interest paid.

$$3500 = 100\%$$

$$350 = 10\%$$

$$35 = 1\%$$

$$17.5 = 0.5\%$$

$$2\% = 70$$

$$2.5\% = 87.5$$

$$87.5 \times 6 = 525$$

525

525	M1	for method to find the interest after one year, eg $3500 \times 2.5 \div 100 (= 87.5)$ oe or $0.025 \times 6 (= 0.15)$ oe or for a complete method, eg $3500 \times 2.5 \times 6 \div 100$ oe or for 4025 or 2975	May be implied by, eg 3587.5(0) Award M1 for 3500×1.025^n
	A1	cao	

2022

50

50

F P2 Q15

15 £3500 is invested in a bank for 6 years.
The bank pays **simple** interest at a rate of 2.5% per year.
Work out the total amount of simple interest paid.

$$2.5 \times 6 = 15$$

$$3500 \div 15 = 233.3$$

$$\underline{233.30}$$

525	M1	for method to find the interest after one year, eg $3500 \times 2.5 \div 100 (= 87.5)$ oe or $0.025 \times 6 (= 0.15)$ oe or for a complete method, eg $3500 \times 2.5 \times 6 \div 100$ oe or for 4025 or 2975	May be implied by, eg 3587.5(0) Award M1 for 3500×1.025^n
	A1	cao	12022 51

51

F P2 Q19

19 (a) Work out the value of $\frac{\sqrt{35.2 + 1.7^2}}{4.6^2 - 8.91}$

Write down all the numbers on your calculator display.

$$\underline{5.149969289}$$

(2)

(b) Write your answer to part (a) correct to 2 significant figures.

$$\underline{5.1}$$

(1)

(Total for Question 19 is 3 marks)

(a)	0.517(0189759)	M1	for any correct partial calculation, eg 40.113 or 6.333(482454) or 12.25 or answer of 0.51 or 0.52 or digits 517...	
		A1	for 0.517(...)	Answer must be given to at least 3 decimal places rounded or truncated. Check first 3 significant figures only.
(b)	0.52	B1	for 0.52 or if their answer to part (a) correctly rounded to 2 sf, provided part (a) has at least 3 sf	Do not accept trailing 0, eg 0.520

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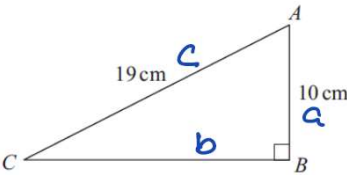
52

Foundation / Higher
Crossover
P2

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F P2 Q20
H P2 Q1

0 *ABC* is a right-angled triangle.



Work out the length of *CB*.
Give your answer correct to 3 significant figures.

$$a^2 + b^2 = c^2$$
$$19^2 - 10^2 = 261$$
$$\sqrt{261} = 16.15549442$$
$$= 16.6$$

16.6

16.2	M1	for a correct first step to find <i>BC</i> , eg $19^2 = 10^2 + BC^2$ or $19^2 - 10^2 (= 261)$ or $\sqrt{19^2 - 10^2}$ or $\sqrt{261}$ or $3\sqrt{29}$	Can use alternative letter for <i>BC</i> provided intention is clear If using an alternative method using trigonometry must have <i>BC</i> as the only unknown
	A1	for answer in the range 16.1 to 16.2	ISW incorrect rounding if answer given in range

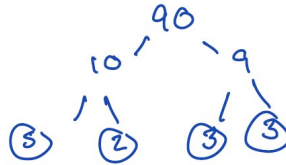
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54

54

F P2 Q21a
H P2 Q2a

(a) Write 90 as a product of its prime factors.



$$\underline{5 \times 2 \times 3 \times 3}$$

(a)	$2 \times 3 \times 3 \times 5$	M1	for a complete method to find prime factors; could be shown on a complete factor tree with no more than one error or by division by prime factors with no more than one error or for 2, 3, 3, 5	Condone the inclusion of 1 for this mark
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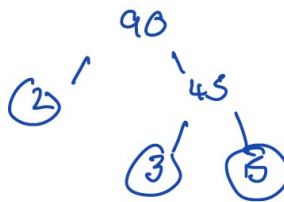
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55

55

F P2 Q21a
H P2 Q2a

(a) Write 90 as a product of its prime factors.



$$\underline{2 \times 3 \times 3 \times 5}$$

(a)	$2 \times 3 \times 3 \times 5$	M1	for a complete method to find prime factors; could be shown on a complete factor tree with no more than one error or by division by prime factors with no more than one error or for 2, 3, 3, 5	Condone the inclusion of 1 for this mark
-----	--------------------------------	----	---	--

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56

F P2 Q22
H P2 Q3

2 The number of hours, H , that some machines take to make 5000 bottles is given by

$$H = \frac{72}{n} \quad \text{where } n \text{ is the number of machines.}$$

On Monday, 6 machines made 5000 bottles.

On Tuesday, 9 machines made 5000 bottles.

The machines took more time to make the bottles on Monday than on Tuesday.

How much more time?

Handwritten solution:

$$\text{Monday } H = \frac{5000}{6} = 833\frac{1}{3} \text{ or } \frac{2500}{3}$$

$$72 \div 6 = 12 \text{ hours Monday}$$

$$\begin{array}{r} 108 \\ - 72 \\ \hline 36 \end{array}$$

36 hours

(Total for Question 22 is 2 marks)

4	M1	for method to use formula, eg $72 \div 6 (=12)$ or $72 \div 9 (=8)$	Can be implied by $\frac{72}{6}$ or $\frac{72}{9}$
	A1	cao	

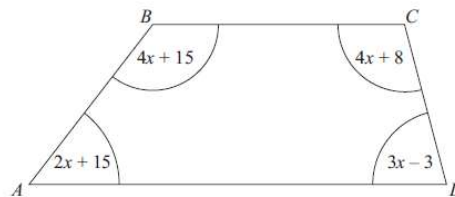
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F P2 Q26
H P2 Q7

$ABCD$ is a quadrilateral.



All angles are measured in degrees.

Show that $ABCD$ is a trapezium.

Handwritten solution:

$$4x + 4x + 2x + 3x = 15 + 15 + 8 - 3 = 35$$

$$13x + 35 = 360$$

$$-35 \quad -35$$

$$13x = 325$$

$$\frac{325}{13} = 25$$

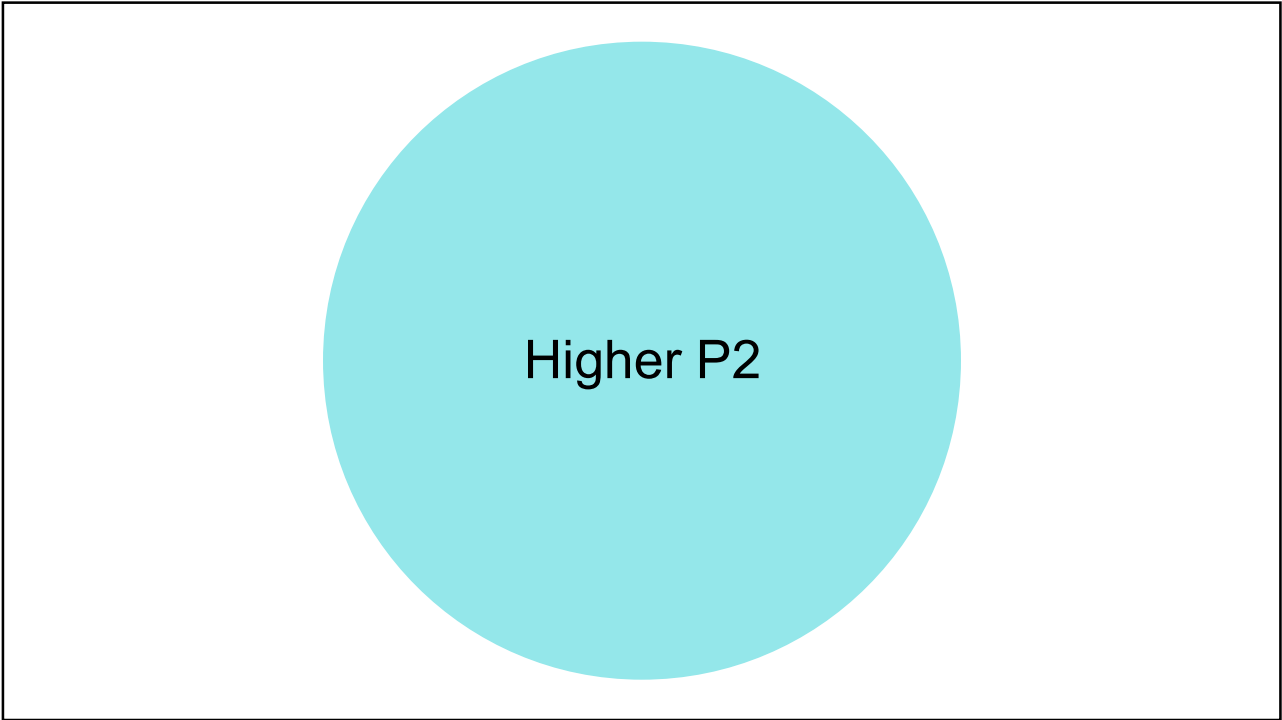
$$x = 25$$

Shown with reason given	M1	for deriving a suitable equation, eg $4x + 15 + 2x + 15 + 4x + 8 + 3x - 3 = 360$ or $13x + 35 = 360$ or $4x + 15 + 2x + 15 = 180$ or $6x + 30 = 180$ or $4x + 8 + 3x - 3 = 180$ or $7x + 5 = 180$	May be seen in an equation
	M1	(dep) for a method to isolate terms in x , eg $4x + 2x + 4x + 3x = 360 - 15 - 15 - 8 + 3$ or $4x + 2x = 180 - 15 - 15$ or $4x + 3x = 180 - 8 + 3$	
	A1	for solving equation to $x = 25$	
	C1	for substituting $x = 25$ into $A + B$ or $C + D$ and showing $= 180$, and gives a suitable statement, eg co-interior/alternate angles (sum to 180), or since $A + B = 180$ the lines are parallel	If starting with an equation $= 180$ need to substitute into the opposite pair.
Shown	M1	Alternative solution assuming it is a trapezium for deriving a suitable equation, eg $4x + 15 + 2x + 15 = 4x + 8 + 3x - 3$ or $6x + 30 = 7x + 5$	
	M1	(dep) for a method to isolate terms in x , eg $15 + 15 - 8 + 3 = 4x + 3x - 4x - 2x$	
	A1	for solving equation to $x = 25$	
	C1	for a fully correct statement, eg since $A + B = 180$ the lines are parallel	

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H P2 Q8

A playground is in the shape of a right-angled triangle.

28

x

3.5

40m = 8cm

Dan makes a scale drawing of the playground.
He uses a scale of 1 cm represents 5 m

The area of the playground on the scale drawing is 28 cm²

The real length of QR is 40 m

Work out the real length of PQ .

$$\frac{40}{5} = 8$$
$$\frac{28}{8} = 3.5 \times 5 = 17.5m$$

17.5

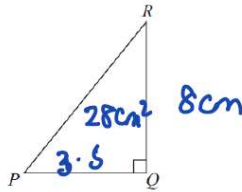
MARKS	MARK	MARK SCHEME	ASSESSMENT GUIDANCE
35	P1	for one correct use of the given scale, eg $40 \div 5 (= 8)$ or $28 \times 5^2 (= 700)$	Can award these marks in either order
	P1	for process to use area of triangle, eg $28 = \frac{1}{2} \times PQ \times [QR]$ or $[area] = \frac{1}{2} \times PQ \times 40$	<p>[QR] must be clearly identified as the drawing length, and cannot be 40</p> <p>[area] must be clearly identified as the real area, and cannot be 28</p>
	A1	cao	

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60

H P2 Q8

A playground is in the shape of a right-angled triangle.



Dan makes a scale drawing of the playground.
He uses a scale of 1 cm represents 5 m

The area of the playground on the scale drawing is 28 cm^2

The real length of QR is 40 m

Work out the real length of PQ .

$$\begin{aligned} 40 \div 5 &= 8 \\ 28 \div 8 &= 3.5 \\ 3.5 \times 8 &= 28 \\ 3.5 \times 5 &= 17.5 \end{aligned}$$

17.5

MARKS	MARK	MARK SCHEME	ASSESSMENT GUIDANCE
35	P1	for one correct use of the given scale, eg $40 \div 5 (= 8)$ or $28 \times 5^2 (= 700)$	Can award these marks in either order
	P1	for process to use area of triangle, eg $28 = \frac{1}{2} \times PQ \times [QR]$ or $[\text{area}] = \frac{1}{2} \times PQ \times 40$	$[QR]$ must be clearly identified as the drawing length, and cannot be 40 $[\text{area}]$ must be clearly identified as the real area, and cannot be 28
	A1	cao	

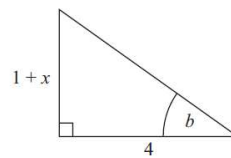
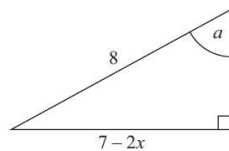
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H P2 Q10

The diagram shows two right-angled triangles.



All lengths are measured in centimetres.

Given that

$$\sin a = \tan b$$

work out the value of x .

$$\sin(a) = \frac{7-2x}{8}$$

$$\tan(b) = \frac{1+x}{4}$$

$$\sin^{-1}\left(\frac{7-2x}{8}\right) = \tan^{-1}\left(\frac{1+x}{4}\right)$$

MARKS	MARK	MARK SCHEME	ASSESSMENT GUIDANCE
1.25	B1	for $(\sin a =) \frac{7-2x}{8}$ or $(\tan b =) \frac{1+x}{4}$	
	P1	for start of a process to solve $\frac{7-2x}{8} = \frac{1+x}{4}$, eg $4(7-2x) = 8(1+x)$ or $28-8x = 8+8x$ or $7-2x = 2(1+x)$ or $7-2x = 2+2x$ or $\frac{7-2x}{8} = \frac{2(1+x)}{8}$ or $\frac{7-2x}{8} = \frac{2x+2}{8}$	Must come from a correct equation
	A1	for 1.25 oe	

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H P2 Q12

12 f is inversely proportional to d^2 $f = 3.5$ when $d = 8$ (a) Find an equation for f in terms of d .

$$f \propto \frac{1}{d^2} \quad F = \frac{224}{d^2}$$

$$f = \frac{k}{d^2}$$

$$3.5 = \frac{k}{8^2}$$

$$k = 3.5 \times 64$$

$$f = \frac{224}{d^2}$$

(2)

(b) Find the positive value of d when $f = 10$

Give your answer correct to 3 significant figures.

$$10 = \frac{224}{d^2}$$

$$d^2 = \frac{224}{10}$$

$$d^2 = 22.4$$

$$= 4.73286$$

$$d = 4.73$$

(2)

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	$f = \frac{224}{d^2}$	M1	for $3.5 = \frac{k}{8^2}$ oe ($k = 224$)	Accept use of \propto for the M
		A1	for $f = \frac{224}{d^2}$ oe	mark
(b)	4.73	M1	for $10 = \frac{224}{d^2}$ or $d^2 = 224 \div 10$	
		A1	or fit their value for k provided $f = \frac{k}{d^2}$ is used for answer in range 4.73 to 4.733	

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H P2 Q16

Solve $(4x - 3)(x + 5) < 0$

$$4x - 3 = 0$$

$$+3 \quad +3$$

$$4x = 3$$

$$\div 4 \quad \div 4$$

$$x = \frac{3}{4}$$

$$\frac{3}{4} = 0.75$$

$$x + 5 = 0$$

$$-5 \quad -5$$

$$x = -5$$

$$-5 < x < \frac{3}{4}$$

M1

for critical values -5 and $\frac{3}{4}$ oe

A1

oe

Could be written as two separate expressions,
eg $x > -5$ and $x < \frac{3}{4}$ oe

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64

H P2 Q16

Solve $(4x - 3)(x + 5) < 0$

$$4x^2 + 20x - 3x - 15 < 0$$

$$4x^2 + 17x - 15 < 0$$

$$x < 0.75$$

$$x < -0.5$$

$$x < 0.75 \text{ or } x < -0.5$$

$$-5 < x < \frac{3}{4}$$

M1

for critical values -5 and $\frac{3}{4}$ oe

A1

oe

Could be written as two separate expressions,
eg $x > -5$ and $x < \frac{3}{4}$ oe

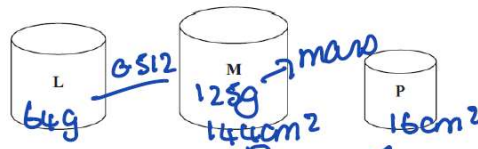
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H P2 Q17

L, M and P are three similar solid cylinders made from the same material.



L has a mass of 64 g
M has a mass of 125 g

M has a total surface area of 144 cm²
P has a total surface area of 16 cm²

Work out:

height of cylinder L : height of cylinder M : height of cylinder P

$$m : p \\ 3 : 1$$

12 : 15 : 5	P1	for process to find ratio of heights of L and M eg $\sqrt[3]{64} : \sqrt[3]{125} (=4 : 5)$ oe or $\sqrt[3]{\frac{64}{125}} (=1:1.25)$ oe or $\sqrt[3]{\frac{64}{125}} : \sqrt[3]{\frac{125}{125}} (=0.8:1)$ oe	Condone not written as a ratio as long as clear $\frac{125}{64} = 1.953... \quad \frac{64}{125} = 0.512$
	P1	for process to find ratio of heights of M and P eg $\sqrt[3]{144} : \sqrt[3]{16} (=12:4=3:1)$ oe or $\sqrt[3]{\frac{144}{16}} (=3:1)$ oe or $\sqrt[3]{\frac{144}{144}} : \sqrt[3]{\frac{16}{144}} (=1:0.3)$ oe	Condone not written as a ratio as long as clear $\frac{144}{16} = 9 \quad \frac{16}{144} = 0.1$
	P1	(dep on P2) for process to find ratio of heights of all 3. eg "(4:5)" × 3 and "(3:1)" × 5 or $(1:1.25) \times 12$ and $(3:1) \times 5$ or $(0.8:1)$ and $(1:0.3)$	
	A1	for 12 : 15 : 5 oe	Can ISW incorrect simplification of a correct ratio

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Foundation P3

67

F P3 Q8

Aisha was born in 1993

There was an election in the year of Aisha's 18th birthday.

There is an election every 5 years.

Will there be an election in 2030?

You must show how you get your answer.

ANSWER	MARKS	MARK SCHEME	ASSUMED GUIDANCE
No from correct figures	P1	for process to find year of Aisha's 18th birthday, eg $1993 + 18 (= 2011)$ or for process to find Aisha's age in 2030, eg $2030 - 1993 (= 37)$	
	P1	for process to find years of future elections, eg writes down 2011, 2016, 2021, 2026, 2031 or for $2011 + 4 \times 5 (= 2031)$ or or for process to find Aisha's age in years when there is an election, eg writes down 18 in 2011, 23 in 2016, 28 in 2021, 33 in 2026 and 38 in 2031 or for process to find years between 18th birthday and election eg $2030 - 2011 (= 19)$	At least 3 correct values needed
	A1	for No with correct figures eg 2011 and 2026 or 2031 or for No with eg 37 and 33 or 38 or for No with 2011 (2016, 2021, ...) and explanation that election years end in 1 or 6, not 0 or for No with 2011 and explanation that 19 is not divisible by 5	At least 3 correct values needed, condone years missing eg 18, 23, 28, ... without 2011, 2016, 2021, ...

23
24
25
26
27
28
29
2030

2012
13
14
15
16
17
18
19
20
21
22

No election in 2030

1993
1994
1995
1996
1997
98
99
2000
2001
2002
3
4
5
6
7
8
9
10
11

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F P3 Q8

Aisha was born in 1993

There was an election in the year of Aisha's 18th birthday.

There is an election every 5 years.

Will there be an election in 2030?

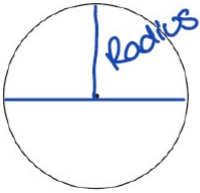
You must show how you get your answer.

1993 + 18 = 2011
 +5
2015
 +5
2020
 +5
2025
 +5
2030 .
Yes there is an election
in 2030

Answers	Mark	Mark Scheme	Assessment Guidance
No from correct figures	P1	for process to find year of Aisha's 18th birthday, eg $1993 + 18 (= 2011)$ or for process to find Aisha's age in 2030, eg $2030 - 1993 (= 37)$	
	P1	for process to find years of future elections, eg writes down 2011, 2016, 2021, 2026, 2031 or for $2011 + 4 \times 5 (= 2031)$ or or for process to find Aisha's age in years when there is an election, eg writes down 18 in 2011, 23 in 2016, 28 in 2021, 33 in 2026 and 38 in 2031 or for process to find years between 18th birthday and election eg $2030 - 2011 (= 19)$	At least 3 correct values needed
	A1	for No with correct figures eg 2011 and 2026 or 2031 or for No with eg 37 and 33 or 38 or for No with 2011 (2016, 2021, ...) and explanation that election years end in 1 or 6, not 0 or for No with 2011 and explanation that 19 is not divisible by 5	At least 3 correct values needed, condone years missing eg 18, 23, 28, ... without 2011, 2016, 2021, ...

F P3 Q10a

10 Here is a circle.



(a) On the diagram above, draw a radius of the circle. (1)

radius drawn	B1	for radius drawn	May be drawn freehand provided intention is clear
--------------	----	------------------	---

F P3 Q11

11 There are 8 episodes in a TV series.
Each episode lasts 45 minutes.
Work out the total time that the 8 episodes last.
Give your answer in hours.

$8 \times 45 = 360$

360..... hours

(Total for Question 11 is 2 marks)

6	M1	for start to method, eg $45 \times 8 (= 360)$ or $(45 \text{ mins} =) 0.75 \text{ oe (hours)}$
	A1	cao

F P3 Q12

12 Write down three prime numbers that are between 20 and 40

21, 23, 25

3 of 23, 29, 31, 37	M1	for two correct and not more than one incorrect, eg 23, 27, 29	May be shown in working space. Ignore numbers less than 20 or greater than 40
	A1	for three correct and no incorrect	Accept 4 correct and no incorrect

F P3 Q12

12 Write down three prime numbers that are between 20 and 40

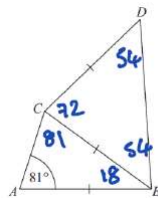
23, 29, 31

3 of 23, 29, 31, 37	M1	for two correct and not more than one incorrect, eg 23, 27, 29	May be shown in working space. Ignore numbers less than 20 or greater than 40
	A1	for three correct and no incorrect	Accept 4 correct and no incorrect

73

73

F P3 Q20

 ABC and BCD are isosceles triangles.
 $AB = BC = CD$
 Angle $CAB = 81^\circ$
Angle $BCD = 4 \times \text{angle } ABC$

Find

the size of angle ABC ; the size of angle BCD
 Give your answer in the form $1:n$
 You must show all your working.

$$\begin{aligned}
 81 \times 4 &= \\
 81 + 81 &= 162 \\
 180 - 162 &= 18 \\
 4 \times 18 &= 72 \\
 180 - 72 &= 108 \\
 108 \div 2 &= 54
 \end{aligned}$$

$$\begin{aligned}
 18:54 \\
 3:n
 \end{aligned}$$

$$3:n$$

Answer	Mark	Mark Scheme	Additional Guidance
1 : 3	M1	for method to find angle ABC , eg $180 - 2 \times 81 (= 18)$ or	
	M1	for method to find angle BCD , eg $"18" \times 4 (= 72)$	
	M1	for method to find angle BCD , eg $\frac{180 - "72"}{2} (= 54)$	Award first 3 marks for angles 18, 72, 54 marked on diagram provided not ambiguous
	M1	(dep M3) for writing as ratio, eg $"18": "54"$ or for an answer of $1:3n$ or $3:1$	
	A1	(dep M3) for $1:3$ from correct working	Accept $n = 3$ $1:3$ or $n = 3$ without working scores 0 marks

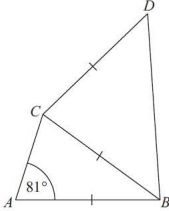
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F P3 Q20

ABC and BCD are isosceles triangles.



$81 \times 4 = 324$

$AB = BC = CD$
Angle $CAB = 81^\circ$
Angle $BCD = 4 \times$ angle ABC

Find
the size of angle ABC ; the size of angle CBD

Give your answer in the form $1:n$
You must show all your working.

1:4

Answer	Mark	Mark Scheme	Additional Guidance
1 : 3	M1	for method to find angle ABC , eg $180 - 2 \times 81 (= 18)$ oe	Award first 3 marks for angles 18, 72, 54 marked on diagram provided not ambiguous
	M1	for method to find angle BCD , eg " $18^\circ \times 4 (= 72)$ "	
	M1	for method to find angle CBD , eg $\frac{180 - "72"}{2} (= 54)$	
	M1	(dep M3) for writing as ratio, eg " $18^\circ : "54"$ " or for an answer of $1 : 3n$ or $3 : 1$	
	A1	(dep M3) for $1 : 3$ from correct working	

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Foundation / Higher
Crossover
P3

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F P3 Q23b
H P3 Q2b

(b) Calculate the value of $9.7 \times 10^6 + 2.45 \times 10^7$
Give your answer in standard form.

34200000

(b)	3.42×10^7	M1	for $9\,700\,000 + 24\,500\,000 (= 34\,200\,000)$ or 3.42×10^n ($n \neq 7$) or or 3.4×10^7 or correct answer in incorrect form eg 34.2×10^6 or both in a form ready for addition, eg $9.7 \times 10^6 + 24.5 \times 10^6$
		A1	cao

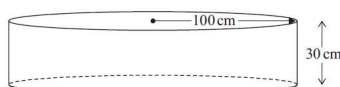
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F P3 Q28
H P3 Q7

A paddling pool is in the shape of a cylinder.



The pool has radius 100 cm.
The pool has depth 30 cm.

The pool is empty.
It is then filled with water at a rate of 250 cm^3 per second.

Work out the number of minutes it takes to fill the pool completely.
Give your answer correct to the nearest minute.
You must show all your working.

$$\begin{aligned} \text{area of circle} &= \pi r^2 \\ &= \pi \times 100^2 \\ &= 31415.92654 \end{aligned}$$

$$\begin{aligned} &31415.9262... \times 300 \\ &= 942477.7961 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} &942477.7961 \div 250 \\ &= 3769.91184 \\ &= \underline{3770} \end{aligned}$$

63	P1	for process to find volume, eg $\pi \times 100^2 \times 30 (= 300000\pi$ or $942477.796...)$	(volume \Rightarrow) 942478 implies P1
	P1	for process to find time in seconds, eg " $942477.796...$ " \div 250 ($= 1200\pi$ or $3769.911...$) or [volume] \div 250 or for converting rate to minutes, eg $250 \times 60 (= 15000)$	(time \Rightarrow) 3770 implies P2 [volume] \neq 30, 60, 100, 250
	P1	for complete process, eg " $3769.911...$ " \sim 60 ($= 20\pi$) or " $942477.796...$ " \sim "15000" ($= 20\pi$)	
	A1	for answer in the range 62 to 63	A correct answer with no supportive working gets 0 marks. If an answer is shown in the range in working and then incorrectly rounded award full marks

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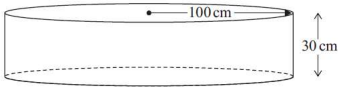
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F P3 Q28

H P3 Q7

A paddling pool is in the shape of a cylinder.



The pool has radius 100 cm.
The pool has depth 30 cm.

The pool is empty.
It is then filled with water at a rate of 250 cm³ per second.

Work out the number of minutes it takes to fill the pool complete
Give your answer correct to the nearest minute.
You must show all your working.

Vol of cylinder
 $= \pi r^2 \times \text{length}$
 $= 10000\pi \times 30$
 $= 300000\pi \text{ cm}^3$

$18 \times 250 \text{ cm}^3$
 $x = 300000 \text{ cm}^3$

$\frac{250x}{250} = \frac{300000}{250}$
 $x = 1200 \text{ s}$
 $60 \text{ s} = 1 \text{ min}$
 $1200 \div 60 = 20 \text{ minutes}$

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63	P1	for process to find volume. eg $\pi \times 100^2 \times 30$ (= 300 000 π or 942 477(.796...))	(volume \Rightarrow) 942 478 implies P1
	P1	for process to find time in seconds. eg "942 477(.796...)" \div 250 (= 1200 π or 3769(.911...)) or [volume] \div 250 or for converting rate to minutes, eg 250 \times 60 (= 15 000)	(time \Rightarrow) 3770 implies P2 [volume] \neq 30, 60, 100, 250
	P1	for complete process. eg "3769(.911...)" \div 60 (= 20 π) or "942 477(.796...)" \div "15 000" (= 20 π)	
	A1	for answer in the range 62 to 63	A correct answer with no supportive working gets 0 marks If an answer is shown in the range in working and then incorrectly rounded award full marks

Higher P3

H P3 Q17

A ball is thrown upwards and reaches a maximum height.
The ball then falls and bounces repeatedly.

After the n th bounce, the ball reaches a height of h_n
After the next bounce, the ball reaches a height given by $h_{n+1} = 0.55h_n$

After the 1st bounce, the ball reaches a height of 8 metres.

What height does the ball reach after the 4th bounce?

$$\begin{aligned}
 \text{1st } 0.55 \times 8 &= 4.4 \\
 \text{2nd } 0.55 \times \text{ANS} &= 2.42 \\
 \text{3rd } 0.55 \times \text{ANS} &= 1.331 \\
 \text{4th } 0.55 \times \text{ANS} &= 0.73205 \\
 &\text{so } \underline{0.732}
 \end{aligned}$$

1.331	M1	for method to find height after 2nd bounce, eg $0.55 \times 8 (= 4.4)$	
	M1	for method to find height after 3rd bounce, eg $0.55 \times "4.4" (= 2.4(2))$ or for method to find height after 4th bounce, eg $0.55^2 \times 8$ or for method to find height after 5th bounce, eg $0.55^4 \times 8 (= 0.73(205))$	Award this mark for $0.55^n \times 8$ where $n > 1$
	A1	for 1.331, accept 1.33, 1.3 or mixed number	If a correct answer is shown and then incorrectly rounded award full mark.

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H P3 Q17

A ball is thrown upwards and reaches a maximum height.
The ball then falls and bounces repeatedly.

After the n th bounce, the ball reaches a height of h_n
After the next bounce, the ball reaches a height given by $h_{n+1} = 0.55h_n$

After the 1st bounce, the ball reaches a height of 8 metres.

What height does the ball reach after the 4th bounce?

$$\begin{aligned}
 0.55 \times 8 + 1 &= 5.4 \\
 0.55 \times 5.4 + 1 &= 3.97 \\
 0.55 \times 3.97 + 1 &= 3.1835 \\
 0.55 \times 3.1838 + 1 &= 2.750925 \\
 &\approx \underline{2.750925}
 \end{aligned}$$

1.331	M1	for method to find height after 2nd bounce, eg $0.55 \times 8 (= 4.4)$	
	M1	for method to find height after 3rd bounce, eg $0.55 \times "4.4" (= 2.4(2))$ or for method to find height after 4th bounce, eg $0.55^2 \times 8$ or for method to find height after 5th bounce, eg $0.55^4 \times 8 (= 0.73(205))$	Award this mark for $0.55^n \times 8$ where $n > 1$
	A1	for 1.331, accept 1.33, 1.3 or mixed number	If a correct answer is shown and then incorrectly rounded award full mark.

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