

Foundation GCSE Mathematics Revision Pack**ALGEBRA – CALC**

Q1. You can use this rule to work out the total charge for hiring a cement mixer.

Total charge = £30 plus £7 for each hour of hire

On Monday, Sally hired a cement mixer for 4 hours.

(a) Work out Sally total charge.

£ (2)

On Tuesday, Tom hired a cement mixer. Tom's total charge was £51

(b) Work out for how many hours Tom hired the cement mixer.

..... hours (3)

(Total 5 marks)

Q2. (a) Solve $3x = 12$

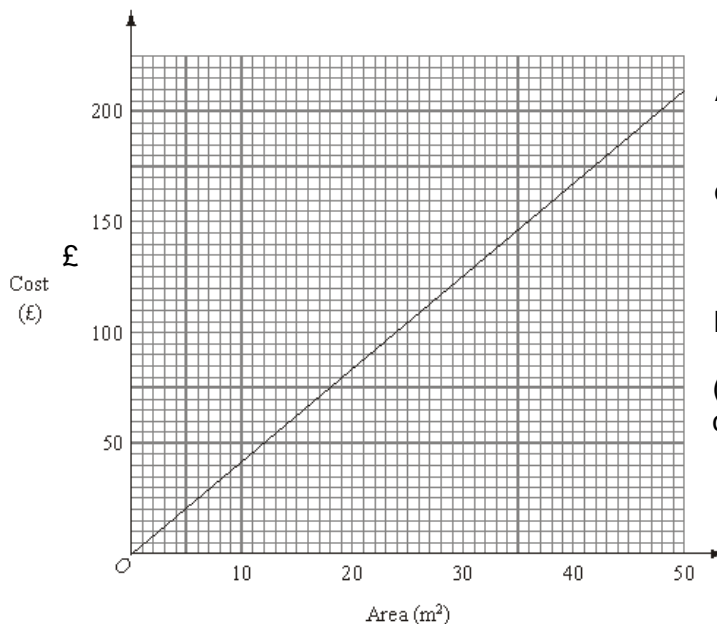
$x = \dots\dots\dots$ (1)

(b) Simplify $4 \times p \times q$

..... (1)

(Total 2 marks)

Q3. John cleans carpets of different areas. He uses this graph to work out the cost.



A carpet has an area of 30 m^2 .

(a) Use the graph to find the cost of cleaning this carpet.

..... (1)

It costs £150 to clean another carpet.

(b) Use the graph to find the area of this carpet.

..... m^2 (1)

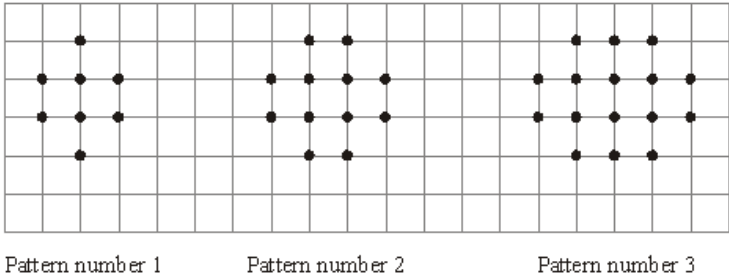
A rectangular carpet has a length of 8.6 m. It has a width of 5 m.

(c) Work out the cost of cleaning this carpet.

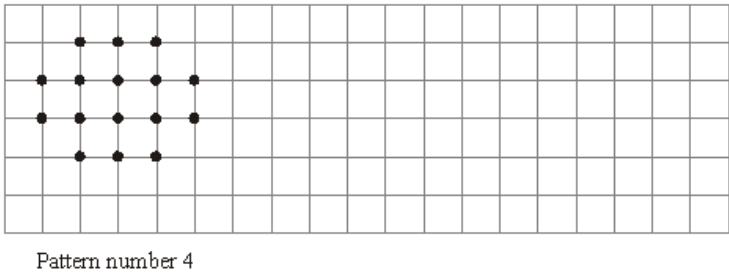
£ (3)

(Total 5 marks)

Q4. Here are some patterns made with dots.



(a) In the space below, complete Pattern number 4



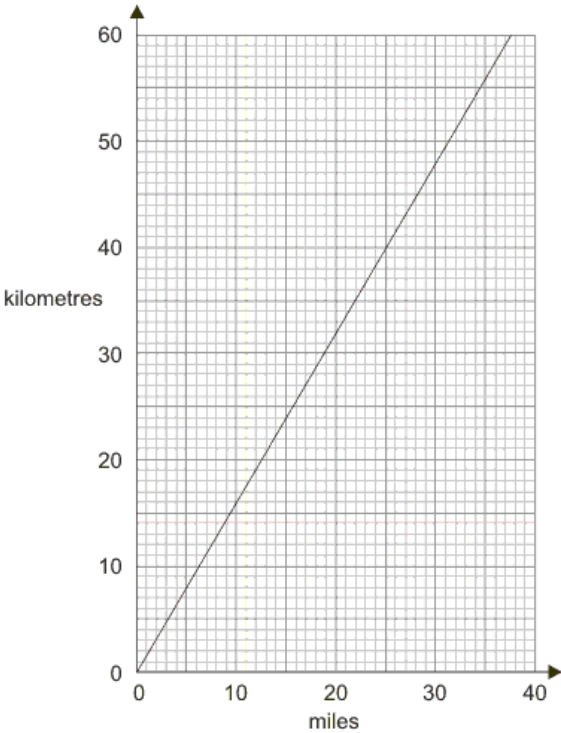
(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of dots	8	12	16		

(2)
(Total 3 marks)

Q5 This conversion graph can be used to change between miles and kilometres.



(a) Use the graph to change 30 miles to kilometres.

.....kilometres (1)

(b) Use the graph to change 40 kilometres to miles.

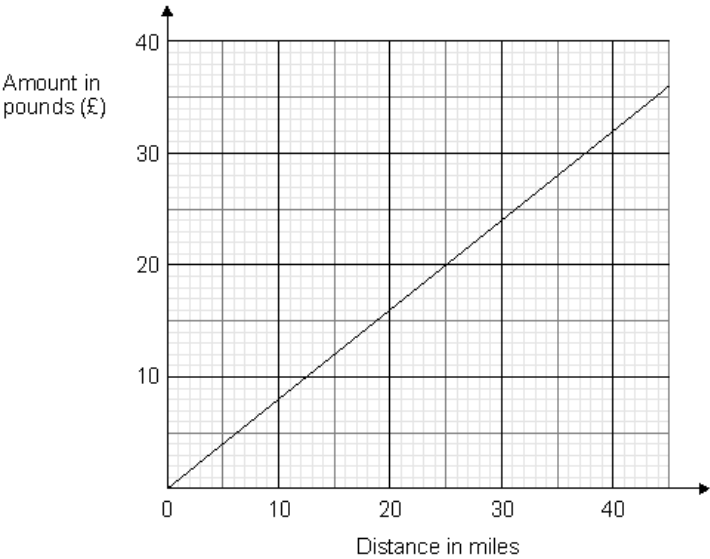
..... miles (1)

(c) Change 100 miles to kilometres.

..... kilometres

(2)
(Total 4 marks)

Q6. Sophie's company pays her 80p for each mile she travels.
 The graph can be used to work out how much her company pays her for travel.



Sophie travels 20 miles.

(a) Work out how much her company pays her. £(1)

Sophie's company paid her £60

(c) Work out the distance Sophie travelled.

..... miles

(2)

(Total 3 marks)

Q7. Erica and Luke use this rule to work out their pay.

Pay = number of hours worked \times rate of pay per hour

Erica worked for 32 hours. Her rate of pay per hour was £5.20

(a) What was Erica's pay?

£ (2)

Luke's pay was £172.50. His rate of pay per hour was £5.75

(b) How many hours did Luke work?

..... hours (2) (Total 4 marks)

Q8. (a) Solve $4x = 12$

$x =$ (1)

b) Solve $y - 7 = 11$

$y =$ (1) (Total 2 marks)

Q9. Here is a table for a two-stage number machine. The machine multiplies by 2, then subtracts 3.

Complete the table.

Input \rightarrow $\times 2$ \rightarrow $- 3$ \rightarrow Output

Input	Output
2	1
4	5
10
.....	27

Q10. (a) Solve $x + 4 = 10$.

$x = \dots\dots\dots$ (1)

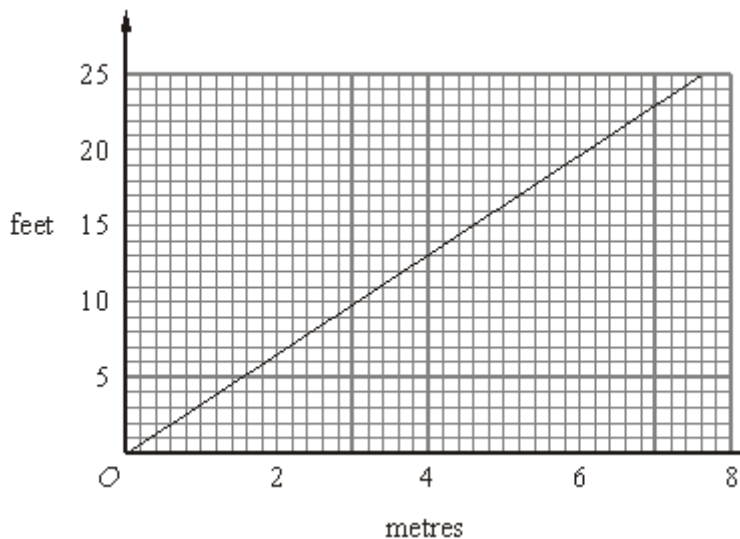
(b) Solve $4y = 20$.

$y = \dots\dots\dots$ (1)

(c) Solve $19 - m = 12$.

$m = \dots\dots\dots$ (1) (Total 3 marks)

Q11.



This conversion graph can be used to change between metres and feet.

(a) Use the conversion graph to change 6 metres to feet.

$\dots\dots\dots$ feet (1)

(b) Use the conversion graph to change 8 feet to metres.

$\dots\dots\dots$ metres (1)

Robert jumps 4 metres. James jumps 12 feet.

(b) (i) Who jumps furthest, Robert or James? $\dots\dots\dots$

(ii) How did you get your answer?

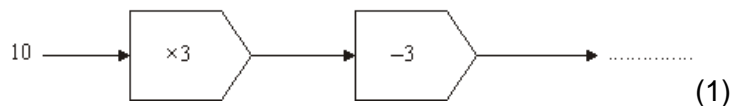
$\dots\dots\dots$ (2) (Total 4 marks)

Q12. The diagram shows a mathematical rule.

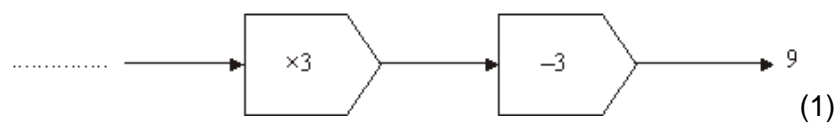


It multiplies a number by 3 and then subtracts 3

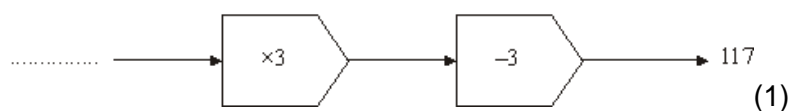
(a) Complete the diagram.



(b)



(c) Complete the diagram.



(Total 3 marks)

Q13. Here are the first 4 terms in a number sequence. 2 5 8 11

(a) Write down the next term in this number sequence.

..... (1)

Here are the first 4 terms in another number sequence. 18 13 8 3

b) Write down the next term in this number sequence.(1) (Total 2 marks)

Q14. (a) Simplify $m + m + m + m$ (1)

(b) Simplify $p \times q \times 4$ (1)

(c) Expand $5(3x + 2)$ (1)

(d) Expand $3y(y + 4)$ (2) (Total 5 marks)

Q15. You can use this rule to work out the cost, in pounds, of hiring a carpet cleaner.

Multiply the number of days hire by 6 Add 4 to your answer

Jill hires the carpet cleaner for 3 days.

(a) Work out the cost.

£ (2)

Carlos hires the carpet cleaner. The cost is £52.

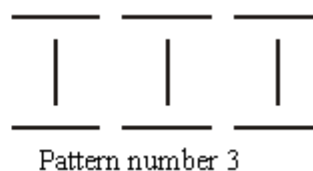
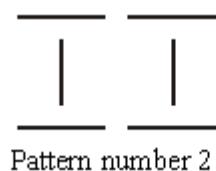
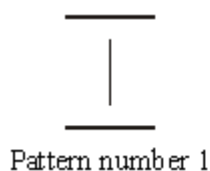
(c) Work out for how many days Carlos hires the carpet cleaner.

..... days (3) (Total 5 marks)

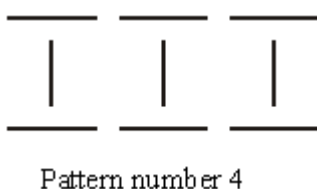
Q16. The first even number is 2.

(a) Write down the 3rd even number. (1)

Here are some patterns made from sticks.



(b) Complete Pattern number 4.



(c) Complete the table.

Pattern number	1	2	3	4	5
Number of sticks	3	6	9		

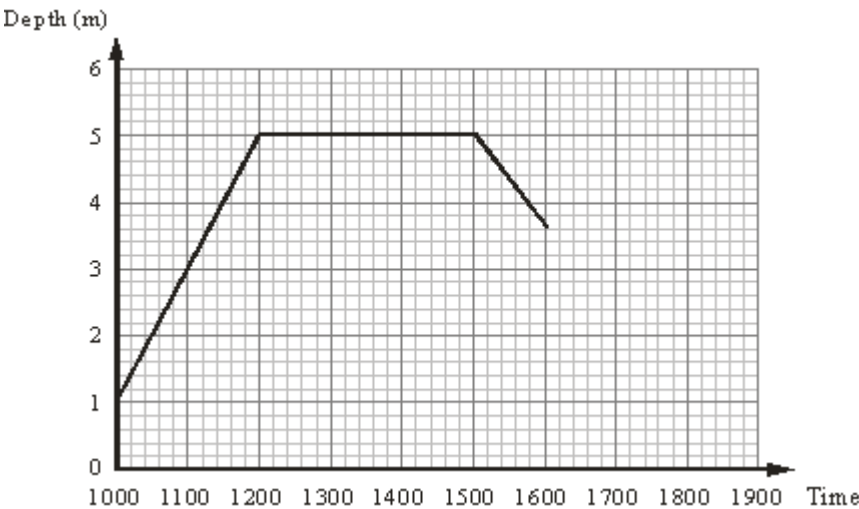
(2)

Jenny wants to find the number of sticks in Pattern number 100.

(d) Write down a method she could use.

.....
(1) (Total 5 marks)

Q17. Rain water is collected in a tank. The graph gives information about the depth of the water in the tank between 1000 and 1600.



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

..... m (1)

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

..... (1)

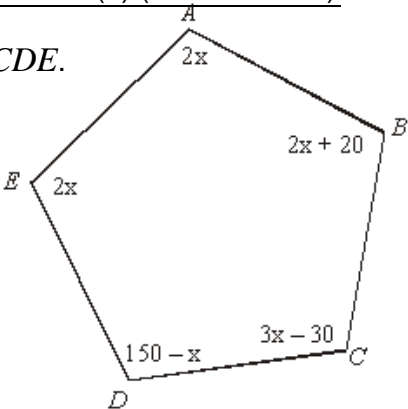
After 1600, the water is used for irrigating a field.
 The depth of water continues to fall at the same rate as it fell between 1500 and 1600.

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

..... (1) (Total 3 marks)

Q18. In the diagram all of the angles are in degrees. Find the size of angle *CDE*.

Diagram **NOT** accurately drawn



..... (Total 4 marks)

Q19. This formula is used to predict the adult height of a baby girl.

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

H = adult height of girl (cm)
 F = height of father (cm)
 M = height of mother (cm)

Karen and Keith have a baby girl. They are interested in finding out how tall their baby girl is likely to grow. Karen has a height of 156 cm. Keith has a height of 172 cm.

- (a) Use the formula to predict the adult height of their baby girl. Show clearly how you get your answer.

Height cm (2)

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

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

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

Height cm (3) (Total 5 marks)

Q20. The graph shows the cost of using a mobile phone for one month for three different tariffs.

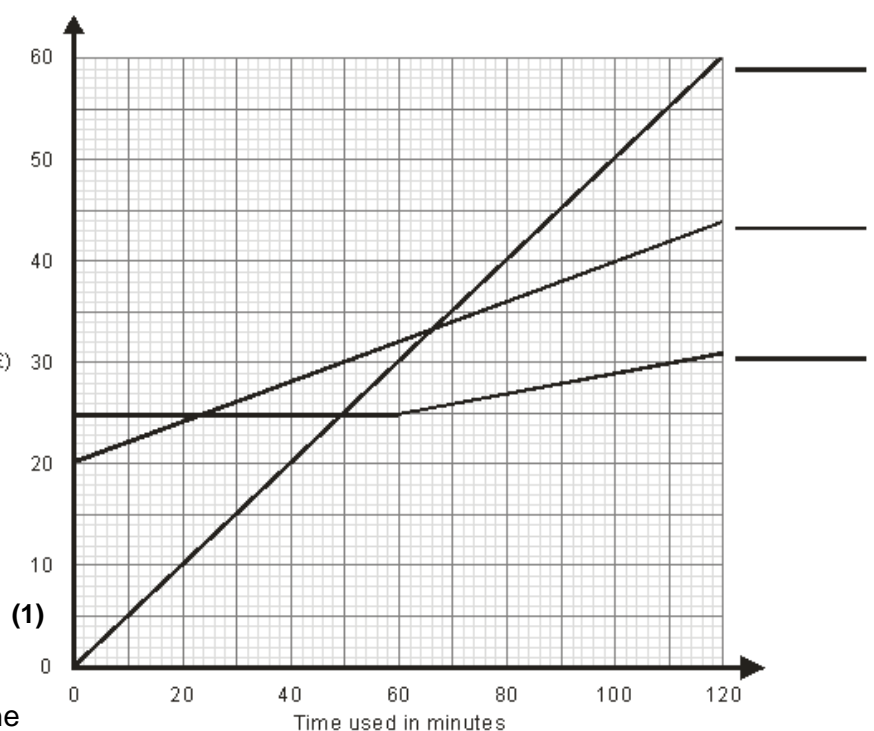
The three tariffs are

Tariff A Rental £20 every minute costs 20p

Tariff B Pay as you go every minute costs 50p

Tariff C Rental £25 first 60 minutes free, then each minute costs 10p

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



Jim uses tariff A for 100 minutes in one month.

(b) Find the total cost.

£ (1)

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

(b) Explain which tariff would be the cheapest for her to use.
You **must** give the reasons for your answer.

.....

.....(2) (Total 4 marks)

	Working	Answer	Mark	Additional Guidance
(a)	$30 + (7 - 4)$	£58	2	M1 $30 + 7 - 4$ or $30 + 28$ A1 cao
(b)	$51 - 30 = 21$ $21 \div 7 = 3$	3	3	M1 $51-30$ or sight of 21 M1 (dep) $21 \div 7$ A1 cao NB: a correct answer which is embedded gets B2
Total for Question: 5 marks				

M2.

	Answer	Mark	Additional Guidance
(a)	4	1	$\frac{12}{3}$ B1 cao Accept
(b)	$4pq$	1	B1 cao
Total for Question: 2 marks			

M3.

	Working	Answer	Mark	Additional Guidance
(a)		£123-£127	1	B1 £123-£127 inclusive
(b)		35-36	1	B1 35-36 inclusive
(c)	$8.6 \times 5 = 43$ at £180	£175-£185	3	M1 8.6×5 A1 43 A1 answers in the range £175-£185 SC: B2 for 43
Total for Question: 5 marks				

M4.

	Answer	Mark	Additional Guidance
(a)	Diagram	1	B1 cao
(b)	20, 24	2	B1 for 20 or ft from drawing in (a) B1 for 24 or ft from £20 + 4
Total for Question: 3 marks			

M5.

	Working	Answer	Mark	Additional Guidance
--	---------	--------	------	---------------------

(a)		48	1	B1 for an answer in the range 47.5 to 48.2
(b)		25	1	B1 cao
(c)	32 ÷ 5 16 ÷ 10 100 ÷ 1.6	155 to 165	2	<p>M1 for complete method reading from graph then multiplying by a suitable scale factor. Eg 1.6 ÷ 100, 8 ÷ 20, 16 ÷ 10,</p> <p>32 ÷ 5, 40 ÷ 4, 48 ÷ $3\frac{1}{3}$ ÷ or valid use of answer to (a) or (b)</p> <p>A1 for answer in the range 155 to 165 or ft on their answers to either (a) or (b)</p>
Total for Question: 4 marks				

M6.

	Working	Answer	Mark	Additional Guidance
(a)	0.80 ÷ 20 OR reading from graph at distance = 20 miles	16	1	B1 cao
(b)	£20 = 25 miles 25 ÷ 3 = 75 OR 60 ÷ 0.8 = 75	75	2	<p>M1 for using £20 = 25 miles oe and intention to multiply</p> <p>OR</p> <p>M1 for 60 ÷ 0.8</p> <p>OR</p> <p>M1 for reading from the graph and an attempt to scale up. ie 37 ÷ 2 or 38 ÷ 2 or 12 ÷ 6 or 12.5 ÷ 6 or 13 ÷ 6 oe</p> <p>And</p> <p>A1 72-78 inclusive</p>
Total for Question: 3 marks				

M7.

	Working	Answer	Mark	Additional Guidance
(a)	32 ÷ £5.20	£166.40	2	<p>M1 for 32 ÷ £5.20</p> <p>A1 cao</p>
(b)	£172.50 ÷ £5.75	30 hours	2	<p>M1 for 172.50 ÷ 5.75</p> <p>A1 cao</p>
Total for Question: 4 marks				

M8.

	Working	Answer	Mark	Additional Guidance
--	---------	--------	------	---------------------

(a)		3	1	B1 cao
(b)		18	1	B1 cao
Total for Question: 2 marks				

M9.

Working	Answer	Mark	Additional Guidance
$(27 + 3) \div 2$	17 15	3	B1 for output 17 M1 for $(27 + 3) \div 2$ or $\frac{27 + 3}{2} + 3$ seen A1 for input 15 SC: B1 for input of 60 or 12 or 16.5
Total for Question: 3 marks			

M10.

	Answer	Mark	Additional Guidance
(a)	6	1	B1 cao
(b)	5	1	B1 cao
(c)	7	1	B1 cao
Total for Question: 3 marks			

M11.

	Answer	Mark	Additional Guidance
(a)	20	1	B1 for 19 to 21
(b)	2.4	1	B1 for 2.3 to 2.5
(c)(i) (ii)	Robert	2	B1 for Robert with a correct conversion (may be evidenced on the graph) (B1 for "Robert"™ with a valid explanation or James with a correct conversion) (may be evidenced on the graph) Note: 4m = 13 feet, 12 ft = 3.6m
Total for Question: 4 marks			

M12.

	Answer	Mark	Additional Guidance
(a)	27	1	B1 cao
(b)	4	1	B1 cao
(c)	40	1	B1 cao
Total for Question: 3 marks			

M13.

	Answer	Mark	Additional Guidance
(a)	14	1	B1 cao
(b)	2^2	1	B1 cao
Total for Question: 2 marks			

M14.

	Working	Answer	Mark	Additional Guidance
(a)		$4m$	1	B1 for $4m$ oe
(b)		$4pq$	1	B1 for $4pq$ or $4qp$ or $p4q$ oe
(c)	$5 \div 3x = 5 \div 2$	$15x = 10$	1	B1 for $15x = 10$ cao
(d)	$3y \div y + 3y \div 4$	$3y^2 + 12y$	2	M1 for $3y \div y + 3y \div 4$ or $3y^2 + a$ or $3y^2 + ay$ or $b + 12y$ or $by^2 + 12y$ where a, b are integers, and can be zero A1 for $3y^2 + 12y$ or $3 \div y^2 + 12 \div y$
Total for Question: 5 marks				

M15.

	Working	Answer	Mark	Additional Guidance
(a)	$6 \div 3 + 4$	22	2	M1 for $6 \div 3$ or for $6 \div 3 + 4$ or 18 seen A1 for 22, accept 22.00 or 22.0
(b)	$52 \div 4 = 48$ $48 \div 6 =$	8	3	M1 for $52 \div 4$ or 48 seen M1 (dep) for $52 \div 4 \div 6$ or $48 \div 6$ A1 for 8 cao Alternative method: M2 for a systematic attempt using $6 \div d + 4$ at least twice with at least one d greater than 5 with correct answers A1 for 8 cao
Total for Question: 5 marks				

M16.

	Working	Answer	Mark	Additional Guidance
(a)		6	1	B1 for 6 cao
(b)		diagram	1	B1 for correct diagram (4 vertical sticks and 8 horizontal sticks)
(c)		12, 15	2	B2 for 12 and 15 (B1 for either 12 or 15 or $12 \div 3 + 3$)

(d)		reason	1	B1 eg for ~ 100 multiplied by 3€^{TM} or $\sim 100 \text{€}^{\text{TM}}$ or $\sim 3\text{€}^{\text{TM}}$ or $\sim \text{€}^{\text{TM}}$ or $3n$ (but not $3n + a$ number) or \sim keep adding 3€^{TM} oe, as long as \sim is mentioned.
Total for Question: 5 marks				

M17.

	Working	Answer	Mark	Additional Guidance
(a)		5 m	1	B1 cao
(b)		10:30	1	B1 10:25 € 10:35
(c)		18:10 € 18:30	1	B1 18:10 € 18:30
Total for Question: 3 marks				

M18.

Working	Answer	Mark	Additional Guidance
$2x + 2x + 40 + 3x \text{€} 30 + 150$ $\text{€} x + 2x$ $= 540$ $8x + 140 = 540$ $x = 50$	100°	4	M1 $2x + 2x + 40 + 3x \text{€} 30 + 150 \text{€} x + 2x$ M1 collects terms correctly A1 $x = 50$ A1 cao
Total for Question: 4 marks			

M19.

	Working	Answer	Mark	Additional Guidance
(a)	$\frac{156 + 174 - 12.5}{2}$	157.75	2	M1 substitute correctly A1 157.75 or 158
(b)	$\frac{j + j - 12.5}{2} = 162$ $2j \text{€} 12.5 = 324$ $\frac{324 + 12.5}{2}$	168	3	$\frac{j + j - 12.5}{2} = 162$ M1 M1 correct method to isolate j A1 168 or better
Total for Question: 5 marks				

M20.

	Working	Answer	Mark	Additional Guidance
(a)		B, A, C	1	B1 cao
(b)		£40	1	B1 cao
(c)		C + reason	2	C2 correct + comparison with the two other tariffs (C1 correct + comparison with one other tariff or line drawn at 60 up from the time axis to intersect at least one line)
Total for Question: 4 marks				