

For **AQA**

Mathematics

Paper 3 (Calculator)

Foundation Tier

Churchill Paper 3D – Marking Guide

Method marks (M) are awarded for a correct method which could lead to a correct answer

Accuracy marks (A) are awarded for a correct answer, having used a correct method, although this can be implied

(B) marks are awarded independent of method



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7	(a)	$= 1024 - 625$ $= 399$		M1 A1	
	(b)	$= \frac{5.236...}{1.7}$ $= 3.0800...$ $= 3.08$ (3sf)		M1 A1	Total 4

8		$0.2 = \frac{1}{5}$ $\frac{1}{0.2} = 5$			
		0.8 2 <u>5</u> 20		B1	Total 1

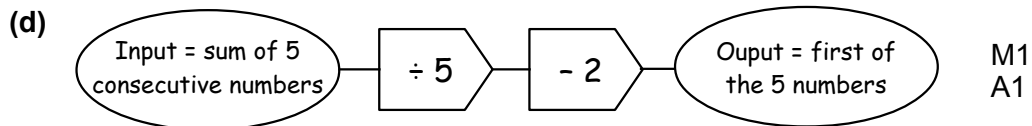
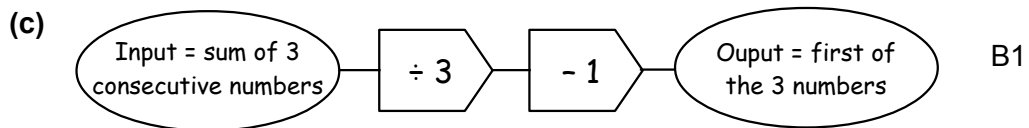
9	(a)	$= 27 - 16 = 11$		B1	
	(b)	16 17 18 20 21 22 22 26 27 Median = 21		M1 A1	
	(c)	Total for 9 days $= 20 + 27 + 16 + 17 + 21 + 22 + 18 + 26 + 22$ $= 189$ Total for 10 days = $10 \times 21.3 = 213$ Orders on day 10 = $213 - 180 = 24$		M1 M1 A1	Total 6

10		$\frac{2}{5} = 0.4$ $P + 0.4P = 1.4P$			
		$0.4 \times P$ $1.2 \times P$ <u>$1.4 \times P$</u> $2.5 \times P$		B1	Total 1

11	(a)	10% of £450 = £45 20% of £450 = £90 New price = £450 - £90 = £360		M1 A1	
	(b)	Increase = $214 - 200 = £14$ % increase = $\frac{14}{200} \times 100\%$ $= \frac{14}{2} \% = 7\%$		M1 A1	Total 4

12	(a)	e.g. 160° represents 32 students 40° represents $32 \div 4 = 8$ students 120° represents $3 \times 8 = 24$ students 24 students were 17 years old		M1 A1	
	(b)	e.g. $360 - (160 + 120) = 360 - 280 = 80^\circ$ 80° represents $2 \times 8 = 16$ students who are 18 or 19 No. of 19 year olds = $16 \div 4 = 4$ No. of 18 year olds = $3 \times 4 = 12$		M1 M1 A1	Total 5

- 13 (a) e.g. $59 \div 2 = 29.5$
So, $29 + 30 = 59$ B1
- (b) e.g. $45 \div 3 = 15$
So, $14 + 15 + 16 = 45$ M1
A1



[OR: $- 10$ then $\div 5$]

Total 6

14 $\frac{1}{a} + \frac{1}{a} + \frac{1}{a} = \frac{1+1+1}{a} = \frac{3}{a}$

$\frac{1}{a^3}$ $\frac{3}{a^3}$ $\frac{3}{a}$ $\frac{1}{a}$

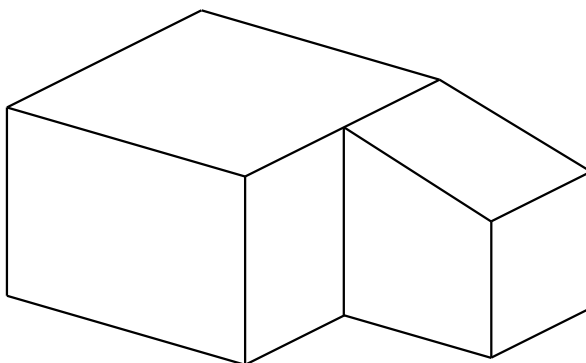
B1 Total 1

- 15 (a) $18 \div 3 = 6$ M1
 $4 + 3 = 7$
 $7 \times 6 = 42$ books A1

- (b) If no blue books added then 18 blue
 $18 \div 2 = 9$
 $3 \times 9 = 27$ green books M1
New total = $18 + 27 = 45$ books
Least no. of books added = $45 - 42 = 3$ A1

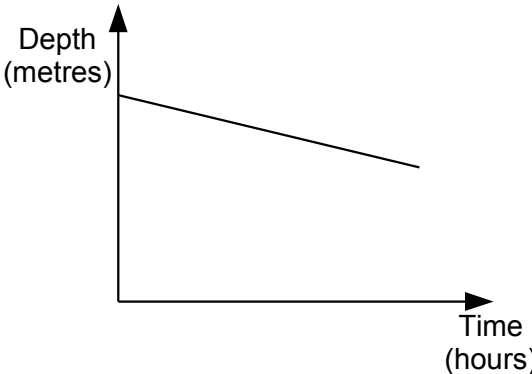
Total 4

16 e.g.



B3

Total 3

17	<p>(a) When $t = 0$, $d = 3 - 0 = 3$ m</p> <p>(b) 4 hours = $4 \times 60 = 240$ minutes When $t = 240$, $d = 3 - 0.004 \times 240$ $= 3 - 0.96$ $= 2.04$ m</p> <p>(c)</p>	B1	
		M1	
		A1	
		B1	
			Total 4

18	<p>(a) $= 0.4 \times 160 = 64$</p> <p>(b) There are now $160 - 10 = 150$ sweets in the bag There are now $64 - 3 = 61$ red sweets in the bag $P(\text{red}) = \frac{61}{150}$</p>	M1 A1	
		M1	
		A1	Total 4

19	<p>Let first term be a and second term be b First three terms are: $a, b, a + b, \dots$ Sum of first three terms = $a + b + (a + b) = 2a + 2b$ $= 2(a + b)$ $= 2 \times 3^{\text{rd}} \text{ term}$</p> <p>Sum of first three terms = 22 so 3^{rd} term = 11</p> <p style="text-align: center;">9 10 11 13</p>	B1	Total 1
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20	<p>Alezin – a packet lasts $48 \div 4 = 12$ days Betadon – a packet lasts $15 \div 3 = 5$ days Cannezole – a packet lasts $20 \div 2 = 10$ days</p> <p>e.g. Need the LCM of 5, 10 and 12 Multiples of 12: 12, 24, 36, 48, 60 ... 60 is first multiple of 12 divisible by 5 and 10 so is LCM On the 61st day she will again open new packets of all 3 May has 31 days, June has 30 days 10th to 31st May is $31 - 9 = 22$ days 1st to 30th June is 30 days $60 - (22 + 30) = 8$ So 8 days into July she will finish packets of all 3 medicines On 9th July she will again have to open new packets of all 3</p>	B1	
		M1	
		M1	
		A1	Total 4

- 21 (a)** Speed = $\frac{\text{distance}}{\text{time}}$ so distance = speed \times time
 20 minutes = $\frac{1}{3}$ hour, 40 minutes = $\frac{2}{3}$ hour
 In first 20 minutes, distance = $30 \times \frac{1}{3} = 10$ km M1
 In last 40 minutes, distance = $24 \times \frac{2}{3} = 16$ km
 Total distance = $10 + 16 = 26$ km M1
 1 km = 4×250 m
 Number of laps = $26 \times 4 = 104$ laps A1
- (b)** $26 \div 2 = 13$ km is half-distance
 13 km = 10 km in first 20 minutes + 3 km M1
 Time = $\frac{\text{distance}}{\text{speed}} = \frac{3}{24}$ hour M1
 $= \frac{1}{8}$ hour = $\frac{1}{8} \times 60$ minutes = $7\frac{1}{2}$ minutes
 Time to half-distance = $20 + 7\frac{1}{2} = 27\frac{1}{2}$ minutes A1 Total 6

- 22 (a)** 3.2 m = 320 cm, 1.4 m = 140 cm
 $320 \div 2 = 160$ tiles in one direction M1
 $140 \div 2 = 70$ tiles in the other direction
 Number of tiles = $160 \times 70 = 11200$ A1
- (b)** e.g. If you first increase the width and then increase the height you also increase the height of the extra bit from making the tile wider. Hence the area increases by more than 20%. B1
- [Or, e.g. Increasing by 10% gives 1.1 times the original. Doing this to both means the area is $1.1 \times 1.1 \times \text{original}$ which is $1.21 \times \text{original}$, a 21% increase.]*
- (c)** $320 \div 2.2 = 145.4\dots$ M1
 $140 \div 2.2 = 63.6\dots$
 Number of tiles or part tiles = $146 \times 64 = 9344$ A1 Total 5

- 23 (a)** $5x < x + 20$
 $4x < 20$ M1
 $x < 5$ A1
- (b)** $(p - 2)(p - 6)$ M1 A1 Total 4

- 24** $2100 = \frac{55}{\text{area}}$
 $2100 \times \text{area} = 55$
 Area = $\frac{55}{2100} = 0.02619\dots \text{ m}^2$ M1
 Area of circle = πr^2 $\pi \times r^2 = 0.02619\dots$
 $r^2 = \frac{0.026190\dots}{\pi} = 0.008336\dots$ M1
 $r = \sqrt{0.008336\dots} = 0.09130\dots \text{ m}$
 Radius = 9.13 cm (3sf) A1 Total 3

TOTAL FOR PAPER: 80 MARKS