

For **AQA**

Mathematics

Paper 3 (Calculator)

Foundation Tier

Churchill Paper 3E – 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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Churchill Paper 3E Marking Guide – AQA Foundation Tier

1	A	B	C	D		B1	Total 1
<hr/>							
2	8	16	64	81		B1	Total 1
<hr/>							
3	$\frac{1}{2}$ is smaller $\frac{11}{15}$ is bigger as $\frac{2}{3} = \frac{10}{15}$ $\frac{5}{9}$ is smaller as $\frac{2}{3} = \frac{6}{9}$						
	0	1	2	3		B1	Total 1
<hr/>							
4	There are 8 green balls so for 1 : 2 we need 4 pink balls We can just remove 2 pink balls						
	2	3	5	7		B1	Total 1
<hr/>							
5	(a) 1 : 4					B1	
	(b) 100 – 35 = 65%						
	Ratio is 35 : 65					M1	
	= 7 : 13					A1	Total 3
<hr/>							
6	(a) $m = 12 \div 5 = 2.4$					B1	
	(b) $6y + 1$					M1 A1	
	(c) $= (2 \times 1.5) - (-3)$					M1	
	$= 3 + 3$						
	$= 6$					A1	
	(d) $r - q = \frac{1}{2}p$					M1	
	$p = 2(r - q)$ [or $2r - 2q$]					A1	Total 7
<hr/>							
7	Louisa: $6 \times \text{£}27 + 2 \times \text{£}45 + 9 \times \text{£}3.50 + 8 \times \text{£}12$ $= 162 + 90 + 31.50 + 96$ $= \text{£}379.50$					M1	
	Adding 1 normal bouquet, total = $379.50 + 27$					A1	
	$= \text{£}406.50$					M1	
	As over £400, 10% discount = $406.50 \div 10 = \text{£}40.65$						
	Discounted total = $406.50 - 40.65 = \text{£}365.85$					M1	
	As £365.85 is less than £379.50 Fatat is correct					A1	Total 5

8 (a)

M1 A1

First Dice	Second Dice
Red	Blue
Red	Green
Red	Purple
Yellow	Blue
Yellow	Green
Yellow	Purple
White	Blue
White	Green
White	Purple

- (b) e.g. The 9 possible outcomes are not equally likely because the number of sides of each colour on the second dice are not the same

B1

Total 3

9 (a) 4.5 m/s

B1

- (b) Speed = $\frac{\text{distance}}{\text{time}}$ so distance = speed \times time
 Distance = 4.5×60
 = 270 m

M1
A1

- (c) 13 minutes
 e.g. His speed suddenly drops rapidly meaning he was no longer trying to go fast

B1
B1

Total 5

- 10 (a) $3.2 \times 4.9 = 15.68$
 $3 - \sqrt{6} = 0.5505\dots$
 $\frac{3.2 \times 4.9}{3 - \sqrt{6}} = 15.68 \div 0.5505\dots$
 = 28.482...
 = 28.5 (1dp)

M1
A1

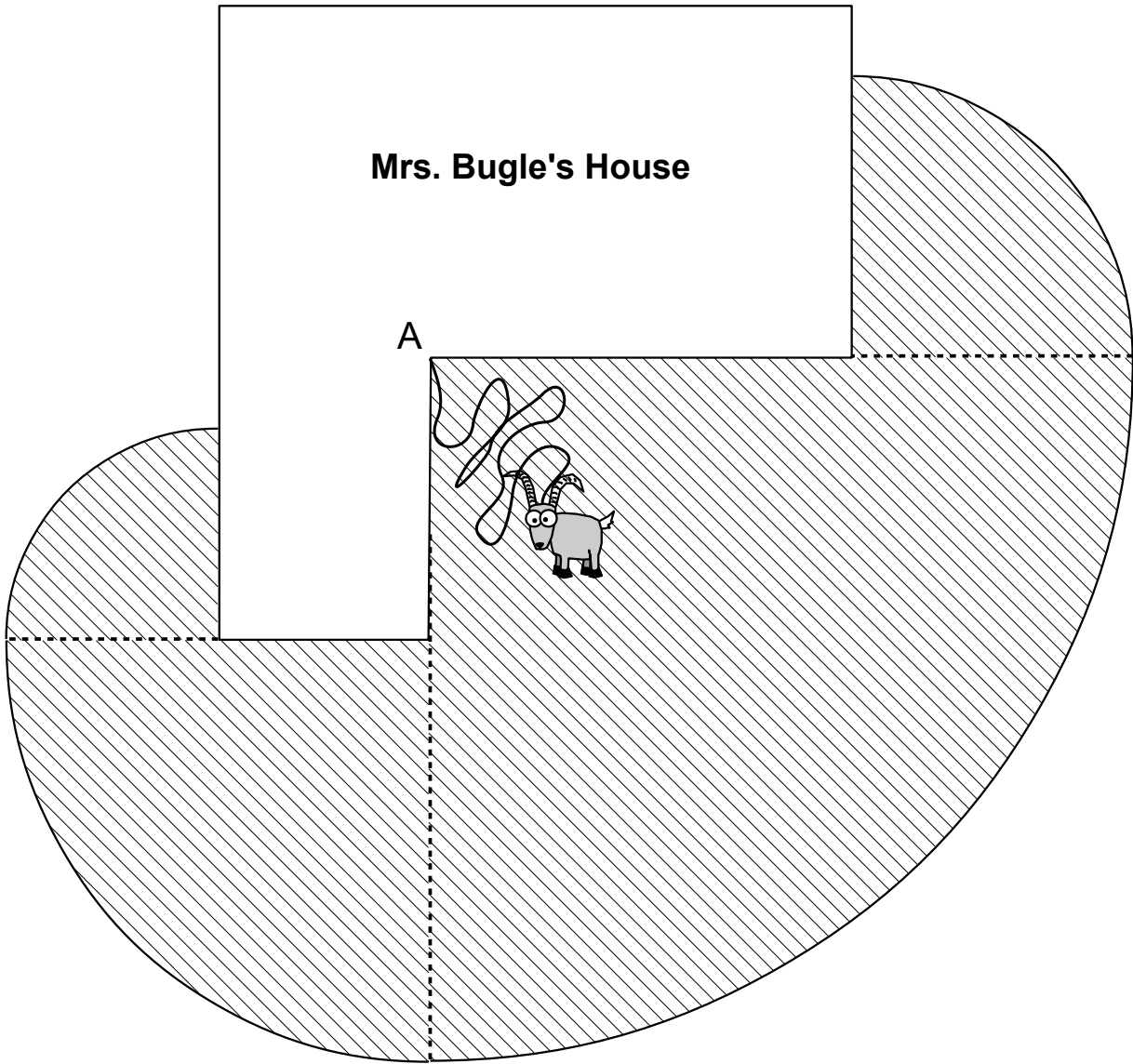
- (b) e.g. $6860 \div 7 = 980$
 $980 \div 7 = 140$
 $140 \div 7 = 20$
 $20 = 2 \times 2 \times 5$
 So $6860 = 2^2 \times 5 \times 7^3$
 $x = 2, y = 3$

M1
A1

- (c) e.g. $294 \div 7 = 42$
 $42 \div 7 = 6$
 $6 = 2 \times 3$
 So $294 = 2 \times 3 \times 7^2$

$$\text{HCF} = 2 \times 7^2 = 98$$

M1 A1 Total 6



Quarter circle radius 10 cm
 Quarter circles radius 6, 4 and 3 cm
 All correct and accurate

B1
 M2
 A1 Total 4

12 (a) Total number of bedrooms
 $= 2 \times 1 + 9 \times 2 + 12 \times 3 + 5 \times 4 + 2 \times 5$
 $= 2 + 18 + 36 + 20 + 10$
 $= 86$
 Mean $= 86 \div 30 = 2.8666... = 2.87$ (3sf)

M1
 M1 A1

(b) $= \frac{5}{30} \times 318$
 $= 53$

M1
 A1

(c) e.g. I have assumed that the selection of houses in the window is representative of the other houses they have for sale

B1 Total 6

- 13 (a)** $225 + 110 + 270 + 85 = 690$
 $690 \div 30 = 23g$
- 15g 17g 19g **23g** B1
- (b)** $\frac{180}{270} = \frac{2}{3}$
 $\frac{2}{3}$ of 30 = 20 cookies
- 15 18 **20** 24 B1
- (c)** To make 30 costs:
 $\frac{225}{250} \times 85 + \frac{110}{2000} \times 245 + \frac{270}{1500} \times 100 + \frac{85}{100} \times 80$ M2
 $= 76.6 + 13.475 + 18 + 68$
 $= 175.975p$
1 cookie costs $175.975 \div 30 = 5.86...p = 5.9p$ (1dp) A1 Total 5
-

- 14 (a)** $C = 2\pi r$ or πd
 $C = \pi \times 10.2 = 32.044... \text{ cm}$ M1
Perimeter of triangle = 32.044... cm
Side of triangle = $32.044... \div 3 = 10.681... \text{ cm}$ M1
 $= 10.7 \text{ cm}$ (3sf) A1
- (b)** Side of square = $32.044... \div 4 = 8.011... \text{ cm}$
Area of square = $(8.011...)^2 = 64.177... \text{ cm}^2$ M1
 $= 64.2 \text{ cm}^2$ (3sf) A1 Total 5
-

- 15** 75% of 70% = $0.75 \times 0.7 = 0.525 = 52.5\%$
 $100 - 70 = 30\%$ of animals are not dogs
40% of 30% = $0.4 \times 0.3 = 0.12 = 12\%$
% of all that come back within 1 month = $52.5 + 12 = 64.5\%$
- 55.5% **64.5%** 65.5% 67.5% B1 Total 1
-

- 16** First rectangle: Height = $6 + 4 = 10 \text{ cm}$
Width = $2 \times 6 = 12 \text{ cm}$
Perimeter = $2 \times (10 + 12) = 2 \times 22 = 44 \text{ cm}$ M1
- Second rectangle: Height = 6 cm
Width = $5 \times 4 = 20 \text{ cm}$
Perimeter = $2 \times (6 + 20) = 2 \times 26 = 52 \text{ cm}$
Increase in perimeter = $52 - 44 = 8 \text{ cm}$
% increase = $\frac{8}{44} \times 100\% = 18.18...%$ M1
The perimeter increases by 18.2% (3sf) A1 Total 3
-

- 17** $1 \text{ m}^2 = 100 \times 100 = 10000 \text{ cm}^2$
 $20 \text{ cm}^2 = 20 \div 10000 \text{ m}^2 = 0.002 \text{ m}^2$
- 0.2 m² 0.02 m² **0.002 m²** 0.0002 m² B1 Total 1
-

18 e.g.

	Year 10	Year 11	Total
Boys		13	37
Girls			
Total		33	75

M1

Leading to

	Year 10	Year 11	Total
Boys	24	13	37
Girls	18	20	38
Total	42	33	75

M1

$$P(\text{Yr10 girl}) = \frac{18}{75} \quad \left[= \frac{6}{25} \right]$$

A1

Total 3

- 19 Let Ayyub have x eggs
Bran has $(x + 1)$ eggs
Curtis has $1.5(x + 1)$ eggs

$$\begin{aligned} \text{So, } \quad x + (x + 1) + 1.5(x + 1) &= 48 \\ 3.5x + 2.5 &= 48 \\ 3.5x &= 45.5 \\ 7x &= 91 \\ x &= 13 \end{aligned}$$

M1

M1

Curtis has $1.5(13 + 1) = 1.5 \times 14 = 21$ eggs
He must end up with $48 \div 3 = 16$ eggs
Curtis gives away 5 eggs

B1

A1

Total 4

20 (a) $(p + 4)(p - 4)$

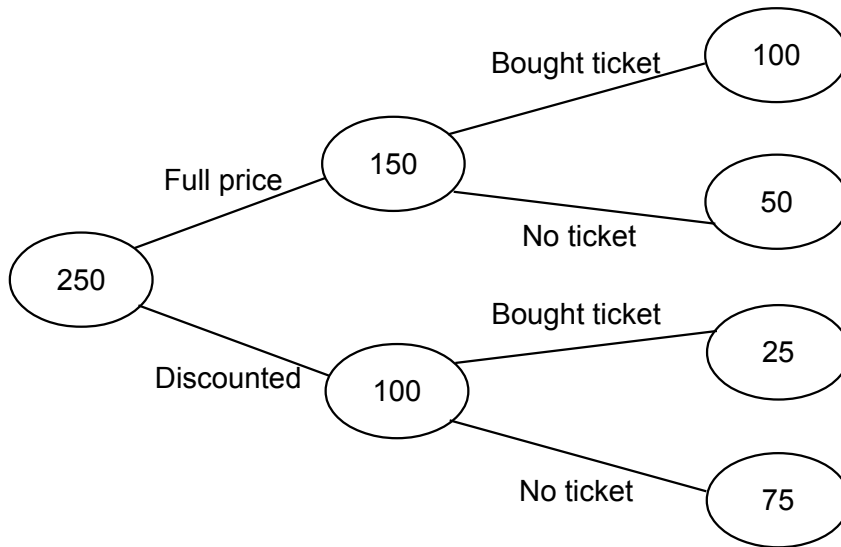
M1 A1

(b) $(t + 4)(t - 2) = 0$
 $t = -4$ or 2

M1

M1 A1 Total 5

- 21** 10% of 250 = 25
 60% of 250 = $6 \times 25 = 150$ M1
 $\frac{1}{3}$ of 150 = $150 \div 3 = 50$
 $\frac{2}{3}$ of 150 = $2 \times 50 = 100$ M1
 So, 80% of those who bought ticket = 100 people
 20% = $100 \div 4 = 25$ people M1
 100% = $5 \times 25 = 125$ people
 125 – 100 = 25 people who didn't pay full price entry bought a ticket



A1

Total 4

- 22 (a)** e.g. After 1 minute, 20% of the original amount is lost.
 After another minute, 20% of the new, smaller amount is lost which is less than 20% of the original amount. Hence, after 5 minutes they haven't lost 100% ($5 \times 20\%$) of the original. B1
- (b)** When reduced by 20%, 80% or 0.8 is left
 After 1 minute, amount left is $0.8 \times \text{£}8000 (= \text{£}6400)$ M1
 After 2 full minutes, amount left = $0.8 \times 0.8 \times \text{£}8000 = \text{£}5120$ A1
- Total 3

- 23** e.g. Angle $AEB = 180 - (57 + 79)$ Angle sum of a triangle M1
 $= 180 - 136 = 44^\circ$
 Angle $CBD = \text{angle } ABE$ Opposite angles
 $= 79^\circ$
 Angle $BCD = 180 - (44 + 79)$ Angle sum of a triangle
 $= 180 - 123 = 57^\circ$
 So, angle $AEB = \text{angle } BDC = 44^\circ$
 angle $BAE = \text{angle } BCD = 57^\circ$ M1
 side $AE = \text{side } CD = 8 \text{ cm}$
 2 angles and included side equal, hence congruent by ASA A1
- Total 3

TOTAL FOR PAPER: 80 MARKS