For **AQA**

Mathematics

Paper 2 (Calculator)

Foundation Tier

Churchill Paper 2B – 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 2B Marking Guide – AQA Foundation Tier

1 **(a)** = 86 – 32 = 54

54 55 84 86 B1

(b) ~~32~~ ~~39~~ ~~52~~ ~~55~~ 63 65 ~~70~~ ~~84~~ ~~84~~ ~~86~~
Median = (63 + 65) ÷ 2 = 64

63 64 65 84 B1 Total 2

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2 e.g. 5 × 1 = 5, 5 × 1.2 = 6
So 1 : 1.2 is equivalent to 5 : 6
[None of the others work]

0.8 : 1 4 : 5 4 : 6 5 : 6 B1 Total 1

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3 **(a)** 100 m 140 m 150 m 280 m B1

(b) 7 seconds B1

[Accept 6.5 to 7.5]

(c) 140 – 120 = 20 m B1 Total 3

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4 2 of the 5-packs costs 2 × £1.80 = £3.60 B1
1 of the 5-packs and 4 individual bars costs £1.80 + 4 × 42p
= £1.80 + £1.68
= £3.48 M1
9 individual bars costs 9 × 42p = £3.78

The least she must spend is £3.48 A1

[Allow valid reasoning for not calculating other totals] Total 3

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5 $\frac{5}{8}$ $\frac{3}{5}$ $\frac{1}{3}$ $\frac{3}{8}$ B1 Total 1

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6 e.g. 50g costs £1.68 ÷ 3 = 56p M1
250g costs 5 × 56p = £2.80 A1 Total 2

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7 Tim has paid 3 × £1.09 = £3.27 B1
Will has paid 2 × £3.75 = £7.50
Total cost = £3.27 + £7.50 = £10.77 M1
Cost per person = £10.77 ÷ 3 = £3.59 M1
Tim is not correct, he has paid less that a third of the total A1 Total 4

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8 **(a)** $\frac{1}{4}$ B1

(b) 60 deliveries are represented by 360º
So 1 delivery is represented by 360 ÷ 60 = 6º M1
Angle for 1 day = 42º
Number of deliveries = 42 ÷ 6 = 7 deliveries A1

(c) Angle for 1 or 2 days = 192º
Angle for 6 or more days = 18º
10 × 18 = 180

e.g. Jerome's statement is correct as the number that arrived in 1 or 2 days is 10 and a bit times the number in 6 or more days B1

[Can say true, false or approx. true as long as justified correctly] Total 4

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9 **(a)** 27 B1

(b) 31 and 39 B1

(c) 37 and 47 B1 Total 3

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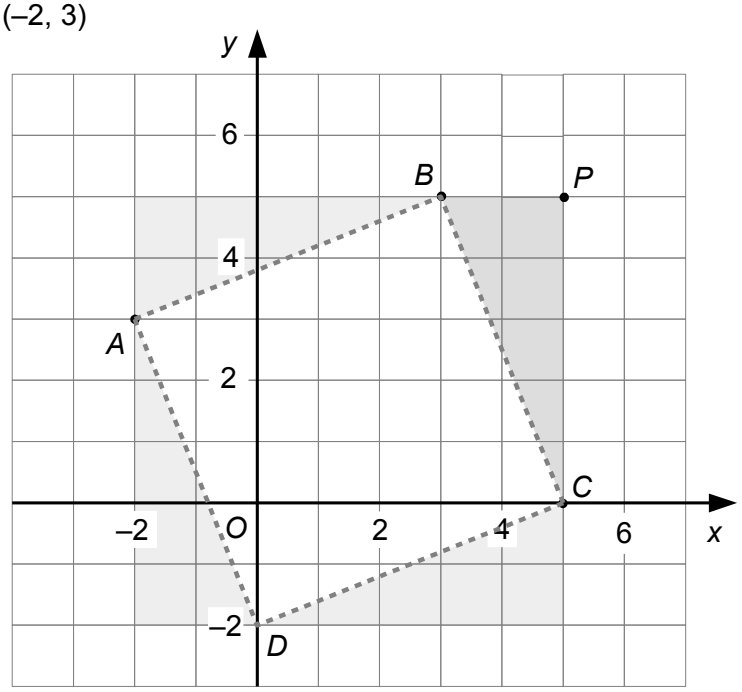
10 **(a)** (–2, 3) B1

(b)



(0, –2) B1

(c) = $\frac{1}{2}$ × 2 × 5 M1
= 5 cm^2 A1

(d) Consider square of side 7 cm, top right corner at *P*
Area of this square = 7^2 = 49 cm^2 M1
Area *ABCD* = 49 – 4 × 5 M1
= 49 – 20
= 29 cm^2 A1 Total 7

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11 Angles on a straight line add up to 180º
180 – 124 = 56º M1
Angles in small right-angled triangle add up to 180º
180 – (90 + 56) = 180 – 146 = 34º M1
Angles in large right-angled triangle add up to 180º
180 – (90 + 34) = 180 – 124 = 56º
x = 56 A1 Total 3

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12 **(a)**

	OS1	OS2	OS3	Total
Females	7	19	21	**47**
Males	3	**18**	32	53
Total	**10**	**37**	53	100

19, 47, 18, 53, 10, 37, 53 entered M1
47 – 19 = 28
28 ÷ 4 = 7 M1
7, 21, 3, 32 entered A1

(b) e.g. % females using OS2 = $\frac{19}{47}$ × 100% = 40.4%
% males using OS2 = $\frac{18}{53}$ × 100% = 34.0% M1
No, I do not agree with Marcus as the percentage of females using OS2 is significantly bigger A1

[Can get marks with different answer, must consider proportions] Total 5

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13 1% = 400000, 0.01% = 4000, 0.02% = 8000

£800 000 £80 000 (£8000) £800 B1 Total 1

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14 e.g. If Mary gave Ryan 5 sweets she would have 5 less and he would have 5 more
As they would then have the same number of sweets she must have originally had 10 more sweets than him M1
3 – 2 = 1 so 1 portion is 10 sweets
5 portions = 5 × 10 = 50 sweets M1 A1
They have 50 sweets between them Total 3

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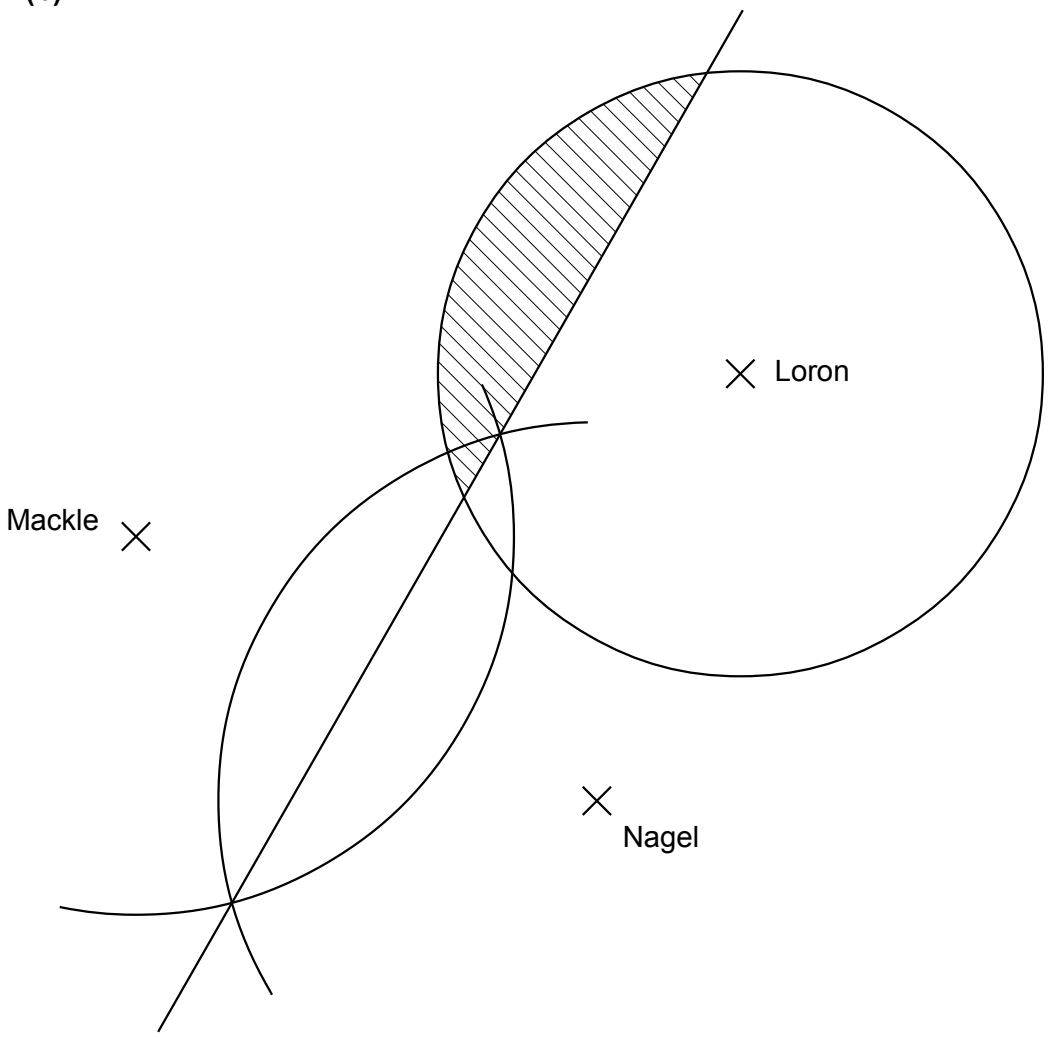
15 **(a)** Distance on map ≈ 8.4 cm M1
Distance = 16.8 km *[Accept 16.5 to 17.1]* A1

(b)



Circle, radius 4 cm, centre Loron B1
Correct method for perpendicular bisector of Mackle and Nagel M1
Correct region shaded and accurate A1 Total 5

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16 **(a)** January 2014 (January 2016) June 2014 January 2017 B1

(b) e.g. No. Although the trend is for the number of applicants to decrease, there is a seasonal variation in which each June has more applicants than the previous January. Hence, June 17 will probably have more applicants than January 17. B2 Total 3

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17 $2\mathbf{a} = \begin{pmatrix} 8 \\ 2 \end{pmatrix}$

$2\mathbf{a} - \mathbf{b} = \begin{pmatrix} 8 \\ 2 \end{pmatrix} - \begin{pmatrix} -2 \\ 3 \end{pmatrix} = \begin{pmatrix} 10 \\ -1 \end{pmatrix}$

$\begin{pmatrix} 6 \\ -1 \end{pmatrix}$ $\begin{pmatrix} 6 \\ -5 \end{pmatrix}$ $\begin{pmatrix} 6 \\ -2 \end{pmatrix}$ $\left(\begin{pmatrix} 10 \\ -1 \end{pmatrix}\right)$ B1 Total 1

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18 Let rain in January be x mm
Rain in February = $(x + 16)$ mm
Rain in March = $[(x + 16) + 5] = (x + 21)$ mm — M1
So, $x + (x + 16) + (x + 21) = 172$ — M1
$3x + 37 = 172$
$3x = 135$
$x = 45$
There was 45 mm of rain in January — A1 — Total 3

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19 $2 + 3 = 5$
$60 \div 5 = 12$
$2 \times 12 = 24$, so she needs 24 litres of pineapple — M1
$24 \div 1.5 = 16$, so she needs 16 cartons of pineapple
Each carton costs £1.30 so 16 cartons cost $16 \times$ £1.30 = £20.80 — A1
$3 \times 12 = 36$, so she needs 36 litres of mango
$36 \div 4 = 9$, so she needs 9 packs of 4 cartons
1 pack costs £3.20 so 9 packs cost $9 \times$ £3.20 = £28.80
Total cost = £20.80 + £28.80 = £49.60 — M1
Total sales = 190×50p = £$(190 \div 2)$ = £95
Profit = £95 – £49.60 = £45.40 — A1 — Total 4

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20 **(a)** The number of circles is twice the pattern number
Number of circles in Pattern 35 = $2 \times 35 = 70$ — B1

(b) The number of squares is the pattern number squared
Number of squares in Pattern 50 = $50^2 = 2500$ — B1

(c) Number of circles in Pattern 3 = 6
Number of circles in Pattern 4 = 8
$6 + 8 = 14$
Number of circles in Pattern 7 = $2 \times 7 = 14$ — B1
So Clive's rule works for these values

(d) e.g. The no. of circles is always twice the pattern number.
The no. of circles in Patterns x and y are just $2x$ and $2y$.
Adding we get $2x + 2y$.
The no. of circles in Pattern $(x + y)$ is $2(x + y)$.
$2x + 2y = 2(x + y)$ so his rule will always work. — M1 A1

[Doesn't have to use x and y, key point is all double pattern no.]

(e) e.g. The number of squares is the pattern number squared
No. of squares in Pattern 2 = $2^2 = 4$
No. of squares in Pattern 6 = $6^2 = 36$
$4 \times 36 = 144$ — M1
$2 \times 6 = 12$
No. of squares in Pattern 12 = $12^2 = 144$ — M1
Yes, Naomi's rule works with these values — A1 — Total 8

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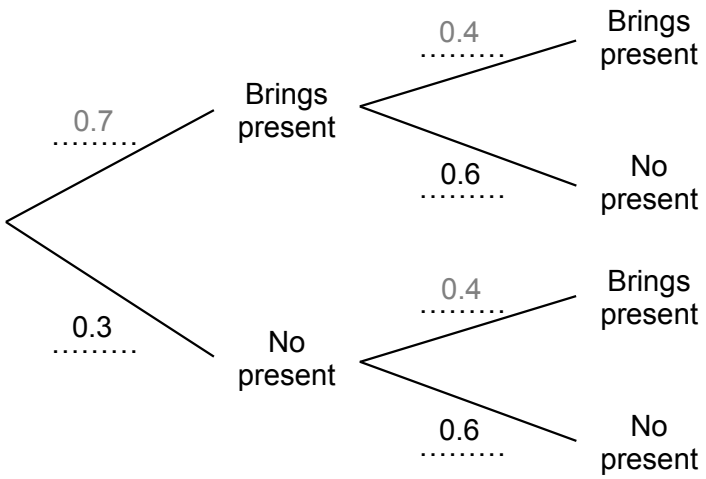
21 **(a)**



B1

(b) $= 0.7 \times 0.4 = 0.28$ M1 A1 Total 3

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22 **(a)** Volume $= 1.3^3 = 2.197$ cm^3 M1

Density $= \dfrac{\text{mass}}{\text{volume}}$

Density $= \dfrac{23}{2.197} = 10.468... = 10.5$ g/cm^3 (1dp) A1

(b) Volume $= 2^3 = 8$ cm^3

Density $= \dfrac{\text{mass}}{\text{volume}}$

$d = \dfrac{\text{mass}}{8}$ M1

Mass $= 8d$ g A1 Total 4

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23 Fraction of circle $= \dfrac{100}{360}$

Area of sector $= \dfrac{100}{360} \times \pi \times 9^2$ M1

$= 70.685...$ M1

$= 70.7$ cm^2 (3sf) A1 Total 3

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24 **(a)** On the x-axis, $y = 0$

So $0 = (x - 2)(x - 8)$

$x = 2$ or 8

The points are (2, 0) and (8, 0) B1

(b) The curve is symmetrical

So x-coord of P is halfway between 2 and 8 M1

$2 + 8 = 10$

$10 \div 2 = 5$ The x-coordinate of point P is 5 A1

(c) When $x = 5$, $y = (5 - 2)(5 - 8)$

$y = 3 \times -3$

$y = -9$ The y-coordinate of point P is -9 B1 Total 4

TOTAL FOR PAPER: 80 MARKS