For **AQA**

Mathematics

Paper 3 (Calculator)

Foundation Tier

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

1 0.066 0.1 0.07 (0.0606) B1 Total 1

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2 1.8 m = 180 cm
180 ÷ 6 = 30 pieces

0 3 20 (30) B1 Total 1

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3 1 × 25 = 25 and 5 × 5 = 25
Factors are 1, 5 and 25
It has 3 factors

2 (3) 4 5 B1 Total 1

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4 3 ÷ 40 = 0.075

0.035 0.07 (0.075) 0.35 B1 Total 1

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5 **(a)** 5 × 2 = 10 people B1

(b) Environment = 7 people
Economy = 15 people
2 × 7 = 14
As 15 is more than twice 7, Holly is correct M1 A1 Total 3

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6 $\frac{3}{5} = \frac{6}{10} = 60\%$ B1
% with packed lunch = 100 – 60 – 5 = 35%
Ratio is 35 : 5 M1 A1
= 7 : 1

[If using 140: at school = 84, home = 7, packed = 49; ratio = 49 : 7 = 7 : 1] Total 3

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7 **(a)** = 10 × 17 = 170 cm M1 A1

(b) e.g. As the height of the new figure is less than the mean height of the other figures it will lower the mean B1 Total 3

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8 **(a)** Length on diagram = 10.8 cm *[10.7 to 10.9 cm]* B1
Actual length = 5.4 m = 540 cm
Ratio = 10.8 : 540 M1
= 1 : 540 ÷ 10.8
= 1 : 50 A1

[In both parts allow 0.1 cm measuring error stated and followed through]

(b) Height on diagram = 4.2 cm
Actual height = 50 × 4.2 M1
= 210 cm [or 2.1 m] A1 Total 5

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9 3pm to midnight = 9 hours
Midnight to 11am = 11 hours
Total time = 9 + 3 × 24 + 11 = 92 hours M1
Cost from BigDig = 20 + 92 × 2 M1
= 20 + 184 = £204
With Machines4U, pay for 3pm Monday to 3pm Friday = 4 days
Cost from Machines4U = 60 + 40 × 3 M1
= 60 + 120 = £180
Machines4U will be cheaper by £24 A1 Total 4

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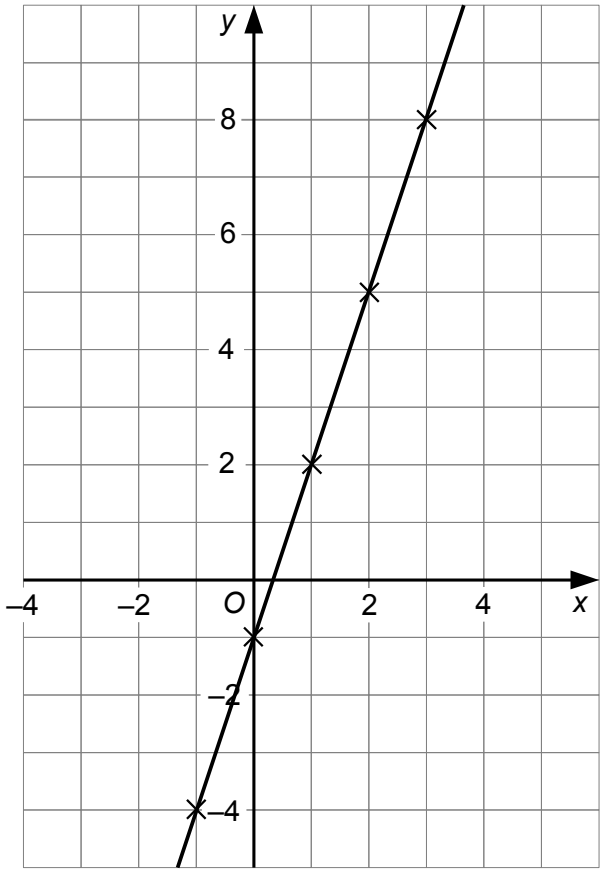
10 **(a)** M1 A1

x	–1	0	1	2	3
y	–4	–1	2	5	8

(b)



M1 A1

Total 4

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11 $3x - 15 = 5x$
$-15 = 2x$
$x = -15 \div 2 = -7.5$

–12.5 **(–7.5)** –5 –2.5 B1 Total 1

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12 **(a)** 19 + 52 = 71
Estimate = $\frac{19}{71}$ [or 0.268 (3sf)] B1

(b) 19 + 26 = 45
71 + 26 + 45 = 142
Estimate = $\frac{45}{142}$ [or 0.317 (3sf)] M1 A1

[Note that 26 + 45 = 71, as in (a), so $\frac{26}{71}$ is not a BETTER estimate]

(c) e.g. It is based on a larger sample of tickets B1 Total 4

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13 **(a)** M1 A1

Starter	*Main*	*Dessert*
Soup	Lasagne	Brownie
Soup	Lasagne	Fruit
Soup	Fish & Chips	Brownie
Soup	Fish & Chips	Fruit
Pate	Lasagne	Brownie
Pate	Lasagne	Fruit
Pate	Fish & Chips	Brownie
Pate	Fish & Chips	Fruit

(b) Total cost = 4 × 8.50 + 4 × 1.80 + 2 × 1.50 M1
= 34.00 + 7.20 + 3
= £44.20
Tip = 50 – 44.20 = £5.80
Tip as % = $\frac{5.80}{44.20}$ × 100% M1
= 13.122...%
The tip was 13% of the bill (nearest whole number) A1 Total 5

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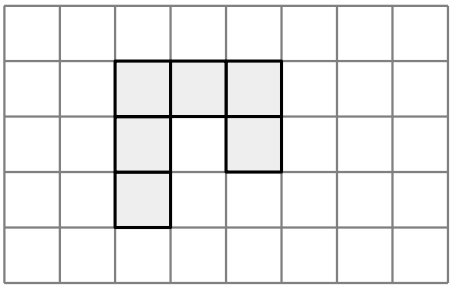
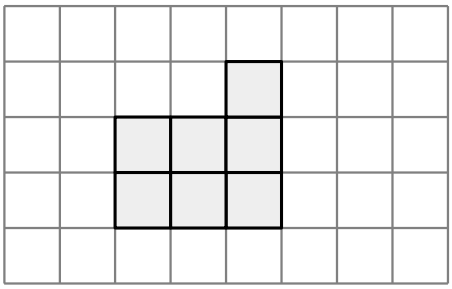
14 **(a)**



B2

(b)



B2

Total 4

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15 –0.15 × 210 0.15 × 210 **0.85 × 210** 1.15 × 210 B1 Total 1

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16 As $AB = AC$ the triangle is isosceles
Hence, angle ACB = angle $ABC = x + 10$ M1
The angle sum of a triangle is 180º so

$3x - 5 + x + 10 + x + 10 = 180$ M1
$5x + 15 = 180$
$5x = 165$
$x = 165 \div 5 = 33$ M1

Angle $ACB = 33 + 10 = 43^\circ$ A1 Total 4

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17 **(a)** 4 weeks = 28 days
$4 \times 28 = 112$ cups of coffee in 4 weeks M1
Weight in one cup = $200 \div 112 = 1.7857...$
= 1.79 g (3sf) A1

(b) 200 g of coffee contains $2 \times 4.2 = 8.4$ g of caffeine
This lasts him 28 days
Amount per day = $8.4 \div 28 = 0.3$ g M1 A1 Total 4

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18 Myra got 6 – 3 = 3 portions more than Louise
3 portions = 12 cards M1
1 portion = $12 \div 3 = 4$ cards M1
Nell got 7 portions = $7 \times 4 = 28$ cards A1 Total 3

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19 e.g. Cube numbers up to 200 are:
$1^3 = 1$, $2^3 = 8$, $3^3 = 27$, $4^3 = 64$, $5^3 = 125$ M1
So Kevin's number could be 2 more than any of these giving:
3, 10, 29, 66, 127
Subtracting 4 from these (to try to get a square number):
–1, 6, 25, 62, 123 M1
25 is the only square number
Kevin's number is 29 A1 Total 3

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20 **(a)** 10 cm = 0.1 m and 40 cm = 0.4 m M1
Area of base = $0.1 \times 0.4 = 0.04$ m^2 A1

(b) Pressure = $\frac{80}{0.04}$ = 2000 N/m^2 M1 A1

(c) Jenna is not correct.
e.g. The force exerted on the table will be roughly the same but the area of contact is much smaller meaning the pressure is much greater B1 Total 5

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21 $(z + 8)(z – 6) = 0$ M1
$z = –8$ or 6 A1 Total 2

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22 $(5 \times 10^{120}) \times (2 \times 10^{130}) = 5 \times 2 \times 10^{120} \times 10^{130}$
$= 10 \times 10^{250}$
$= 10^{251}$

10^{249} 10^{250} 10^{251} 10^{2500} B1 Total 1

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23 **(a)** $\frac{2}{6}$ [= $\frac{1}{3}$] B1

(b) e.g.

B↓ A→	1	1	2	3	3	4
1			✔	✔	✔	✔
3						✔
4						
4						
4						
6						

$\frac{5}{36}$ M1 A1 Total 3

24

1	5	11	19	29			
	4	6	8	10	**12**	**14**	**16**

29 + 12 = 41
41 + 14 = 55
55 + 16 = 71

38 57 59 (71) B1 Total 1

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25 Speed = $\frac{\text{distance}}{\text{time}}$ so time = $\frac{\text{distance}}{\text{speed}}$

Jeff's time = $\frac{400}{6.5}$ = 61.538... seconds M1

Distance = speed × time
In 20 seconds Mike covers 6.3 × 20 = 126 m M1
Mike still needs to run 400 – 30 – 126 = 244 m

Mike's time from here = $\frac{244}{5.9}$ = 41.355 seconds

Mike's total time = 20 + 41.355... = 61.355... seconds M1
Mike crosses the line first A1 Total 4

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26 **(a)** e.g. Each triangle has a right angle
In each triangle one of the angles is x^o M1
As the angles in a triangle add up to 180° the third angle in each triangle must be the same size
All three angles are the same so the triangles are similar A1

(b) e.g. $PQ = 2 \times LM$ M1
So $QR = 2 \times MN$
$= 2 \times 5.5 = 11$ cm A1

(c) $\tan x = \frac{\text{opp}}{\text{adj}} = \frac{5.5}{3}$ M1
= 1.83 (3sf) [or $\frac{11}{6}$ or $1\frac{5}{6}$] A1 Total 6

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27 Perpendicular height of one triangle = $\frac{1}{2} \times (20 - x)$ M1

Area of one triangle = $\frac{1}{2} \times x \times \frac{1}{2}(20 - x)$
$= \frac{1}{4}x(20 - x)$ cm^2

S.A. = area of square base + 4 × area of one triangle
$= x^2 + 4 \times \frac{1}{4}x(20 - x)$ M1
$= x^2 + x(20 - x)$
$= x^2 + 20x - x^2$
$= 20x$ cm^2 A1 Total 3

TOTAL FOR PAPER: 80 MARKS