1380/3H

Question		Working	Answer	Mark	Notes
1	(a)	15 | **25** | 14 | 54 **22** | 8 | 16 | **46** 37 | **33** | **30** | 100	Table	3	B3 for all 5 correct (B2 for 3 or 4 correct) (B1 for 1 or 2 correct)
	(b)		$\frac{37}{100}$	1	$\frac{37}{100}$ B1 $\frac{37}{100}$ oe
2	(c)		$2x + 8y$	2	B2 for 2*x* + 8*y* oe [B1 for 2*x* or 8*y* seen] {Note: −8*y* seen with no working gets B0 4*x* + 2*x* = 6*x* gets B0}
	(b)		$2c + 4r$	2	B2 for 2*c* +4*r* oe [B1 for 2*c* or 4*r* oe seen] Ignore any Left Hand Side = $2c + 4r$ {Note: ignore units or use of 'p'}
3	(a)	*x* | −2 | −1 | 0 | 1 | 2 | 3 *y* | −11 | **−7** | −3 | **1** | **5** | 9	−7, 1, 5	2	B2 all 3 correct (B1 for 1 or 2 correct)
	(b)		Graph	2	B2 for correct line between *x* = −2 and *x* = 3 (B1ft for plotting 5 of their points correctly or for a straight line with gradient 4 or for a straight line passing through (0, −3))

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Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)	$50 = 4k - 10$ $4k = 60$	15	2	M1for $50 = 4k - 10$ oe A1 cao
	(b)	$y = 4\times2 - 3\times5$	-7	2	M1 for $4\times2 - 3\times5$ oe A1 cao
5	(a)		Vertices at (2, -2), (7, -2), (7, -6), (4, -6), (4, -4), (2, -4)	2	B2 for a fully correct rotation [B1 for correct shape with correct orientation **OR** a 90° anticlockwise rotation about *0* **OR** a 180° rotation about *O* **OR** for any 3 correct sides in the correct position]
	(b)		Translation by $\begin{pmatrix}3\\-1\end{pmatrix}$	2	B1 for translation B1 (indep) for $\begin{pmatrix}3\\-1\end{pmatrix}$ or 3 right and 1 down
6	(a)		opp sides are equal	1	B1 for a correct explanation
	(b)	$4x - 2x = 12 - 1$	5.5	2	M1 for $4x + 1 - 1 - 2x = 2x + 12 - 1 - 2x$ oe A1 for 5.5 or 11/2 or 5½
	(c)	'5.5' ×2 + 4×'5.5'+1 + 2×'5.5'+12	57	2	M1 for correct substitution of *x* = '5.5' into the four expressions to find the sum of FOUR sides or 8x + 13 seen A1 ft
7	(a)		15.456	1	B1 cao
	(b)		0.15456	1	B1 cao
	(c)		3220	1	B1 cao

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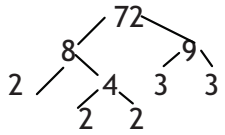
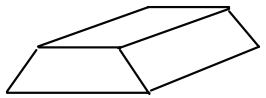
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)	$x^2 = 72 \div 2$	6	2	M1 for 72 ÷ 2 or 36 seen A1 6 or -6 or ± 6
	(b)	$72 = 2 \times 36 = 2 \times 2 \times 18$ $= 2 \times 2 \times 2 \times 9$  	$2 \times 2 \times 2 \times 3 \times 3$	2	M1 for a systematic method of at least 2 correct divisions by a prime number oe factor tree or a full process with one calculation error; can be implied by digits 2, 2, 2, 3, 3 on answer line A1 for $2 \times 2 \times 2 \times 3 \times 3$ or $2^3 \times 3^2$ oe [Note 1 × 2 × 2 × 2 × 3 × 3 gets M1 A0]
9	(a)			2	M1 rectangle with either correct width or height or any square A1 cao
	(b)			2	B2 for a correct sketch (B1 any 3-D sketch of no more than 4 faces seen, with a trapezoidal face)
10		$\frac{40000}{125} = \frac{8000}{25}$ =320 seconds	320	3	M1 for 40 × 1000 or 125 ÷ 1000 or 40000 or 0.125 M1 for $\frac{40000}{125}$ or $\frac{40}{'0.125'}$ A1 cao **OR** M1 for 1000 ÷ 125 M1 for '8' × 40 A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
11	(a)		62.5	1	B1 cao
	(b)		63.5	1	B1 for 63.5 (accept $63.4\dot{9}$ or 63.49.. or any evidence that the 9 is recurring or 63.499 or better)
12			Diagram	4	M1 arc radius 4 cm centre *B* within the guidelines M1 angle bisector from *A* to *BC* within the guidelines A1 for clear indication that inside of arc is being identified as correct region for the first condition, or that side of straight line nearer to *C* is identified as correct region for the second condition. (Note that only 1 of the Ms need be awarded for this A mark to be awarded) A1 fully correct region Ignore any drawing outside the given triangle
13	(a)			2	B1 'What type of magazine do you read?' B1 for at least 2 magazines identified in response boxes [Note: B0 for any data collection sheet/chart
	(b)		How many magazines have you read in the last week 0 ☐ 1 ☐ 2-3 ☐ >3 ☐	2	B1 Relevant question that refers to a time period. B1 for at least 3 mutually exclusive response boxes (need not be exhaustive)
14		$\frac{7\times200}{0.05} = \frac{1400}{0.05}$	28000	3	B1 for any two of 7, 200 or 0.05 M1 for correct processing of at least two of 7, 200 or 190 and 0.05 or 0.1 A1 26600 - 28000

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Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)		6.4×10^4	1	B1 cao
	(b)		1.56×10^{-5}	1	B1 cao
16	(a)		$2x(2x - 3y)$	2	B2 (B1 for $x(4x - 6y)$ or $2(2x^2 - 3xy)$ or $2x$(two terms) or $4x(x - 1.5y)$)
	(b)	$x^2 - x + 6x - 6 =$ $x(x - 1) + 6(x - 1)$	$(x + 6)(x - 1)$	2	B2 cao (B1 $(x - 6)(x + 1)$ or $(x - 6)(x - 1)$ or $x(x - 1) + 6(x - 1)$ or $x(x + 6) - (x + 6)$)
17	(a)		Ogive	2	B1 6 or 7 points plotted correctly ± 1 full (2mm) square B1 (dep) for points joined by curve or line segments provided no gradient is negative – ignore any part of graph outside range of their points (SC: B1 if 6 or 7 points plotted not at end but consistent within each interval and joined)
	(b)		240	2	B2 if answer is in the range 235 – 245 **OR** M1 (dep on graph being cf) for using cf = 60 or 60.5 A1 ft (± 1 square)
	(c)			1	B1ft correct comment comparing money spent by men with money spent by women

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Question		**Working**	**Answer**	**Mark**	**Notes**
18	(a)	*AOD* = 90 - 36 or 180 – (90 + 36)	54	2	M1 *AOD* = 90 − 36 or 180 – (90 + 36) A1 cao
	(b)(i)	*ABC* = *AOD* ÷ 2	27	2	M1 *ABC* = *AOD* ÷ 2 A1 ft from '54'
	(ii)		Reason	1	B1 Angle at centre = twice angle at circumference
19	(a)		$x = 2, y = 3$	1	B1 cao
	(b)		$y = \frac{1}{2}x + 4$	2	M1 for $y = mx + 4$ or $y = \frac{1}{2}x + c$, $c \neq 2$, or $\frac{1}{2}x + 4$ A1 for $y = \frac{1}{2}x + 4$ oe
20	(a)	$3t + 1 < t + 12$ $3t - t < 12 - 1$ $2t < 11$	$t < 5.5$	2	M1 $3t - t < 12 - 1$ A1 $t < 5.5$ oe (B1 for t = 5.5 or t > 5.5 or 5.5 or $t \leq 5.5$ or $t \geq 5.5$ on the answer line)
	(b)		5	1	B1 for 5 or ft (a)
21		$M = kL^3$ $k = \frac{M}{L^3} = \frac{160}{8} = 20$ When $L = 3$, $M = 20 \times 3^3$	540	4	M1 for $M \propto L^3$ or $M = kL^3$ A1 k = 20 M1 for '20'×3^3 A1 for 540 cao

<table>
<tr><th colspan="6">1380/3H</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>22</td><td></td><td><table><tr><td>F</td><td>4</td><td>10</td><td>24</td><td>20</td><td>6</td></tr><tr><td>Fd</td><td>0.8</td><td>1</td><td>1.6</td><td>2</td><td>1.2</td></tr></table>or<table><tr><td>F</td><td>4</td><td>10</td><td>24</td><td>20</td><td>6</td></tr><tr><td>Fd</td><td>4</td><td>5</td><td>8</td><td>10</td><td>6</td></tr></table></td><td>Correct histogram</td><td>4</td><td>M1 use of frequency density as frequency ÷ width (can be implied by two correct frequency densities or two correct bars with different widths) or area (can be implied by one correct bar) to represent frequency

A2 for all 5 histogram bars correct ±½ square
(A1 at least 3 correct histogram bars ±½ square)

A1 for correct label and scale numbered appropriately or for key and consistent scaling</td></tr>
<tr><td>23</td><td>(a)

(b)</td><td>

prob(WW) = 0.5×0.5</td><td>Correct diagram

0.25</td><td>2

2</td><td>B1 for 0.2 oe seen on bottom left branch
B1 for correct probabilities on other branches

M1for 0.5 × ‘0.5’

A1ft for 0.25 oe</td></tr>
</table>

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Question		**Working**	**Answer**	**Mark**	**Notes**
24	(a)	*AB* = *AC* (equilateral triangle) *AD* is common *ADC*=*ADB* (= 90° given) $\Delta ADC \equiv \Delta ADB$ (RHS) OR *DAC* = *DAB* (since *ACD* = *ABD* and *ADC* = *ADB*) *AB* = *AC* (equilateral triangle) *AD* is common $\Delta ADC \equiv \Delta ADB$ (SAS) OR *DAC* = *DAB* (since *ACD* = *ABD* and *ADC* = *ADB*) *AD* is common *ACD* = *ABD* (equilateral triangle) $\Delta ADC \equiv \Delta ADB$ (AAS)	Proof	3	M1 for any three correct statements (which do not have to be justified) that together lead to a congruence proof (ignore irrelevant statements) A1 for a full justification of these statements A1 for RHS, SAS, AAS, ASA or SSS as appropriate NB The two A marks are independent
	(b)	*BD* = *DC* (congruent Δs) *BC* = *AB* (equilateral Δs) Hence *BD* = $\frac{1}{2}AB$	Proof	2	B1 for *BD* = *DC* and *BC* = *AB* B1 for justification of these statements and completion of proof

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Question		**Working**	**Answer**	**Mark**	**Notes**
25	(a)	$\frac{1}{2\frac{1}{2}}+\frac{1}{3\frac{1}{3}}=\frac{1}{f}$ $\frac{2}{5}+\frac{3}{10}=\frac{1}{f}$ $\frac{7}{10}=\frac{1}{f}$	$\frac{10}{7}$	3	M1 $\frac{1}{2\frac{1}{2}}+\frac{1}{3\frac{1}{3}}=\frac{1}{f}$ M1 correct addition of the fractions to get $\frac{7}{10}$ oe A1 for $\frac{10}{7}$ oe
	(b)	$\frac{1}{u}=\frac{1}{f}-\frac{1}{v}$ $\frac{1}{u}=\frac{v-f}{fv}$	$u=\frac{fv}{v-f}$	2	M1 $\frac{1}{u}=\frac{v-f}{fv}$ oe or $vf+uf=uv$ oe or $\frac{1}{u}=\frac{f-v}{fv}$ **or** $u=\frac{1}{\frac{v-f}{fv}}$ or $u=\frac{1}{\frac{1}{f}-\frac{1}{v}}$ A1 $u=\frac{fv}{v-f}$ or $u=\frac{-fv}{f-v}$
26	(a)		$y = f(x-4)$	2	B2 cao (B1 for f(x - 4) or $y = f(x + a)$, $a \neq -4$, $a \neq 0$)
	(b)			2	B2 cao (B1 cosine curve with either correct amplitude or correct period, but not both)

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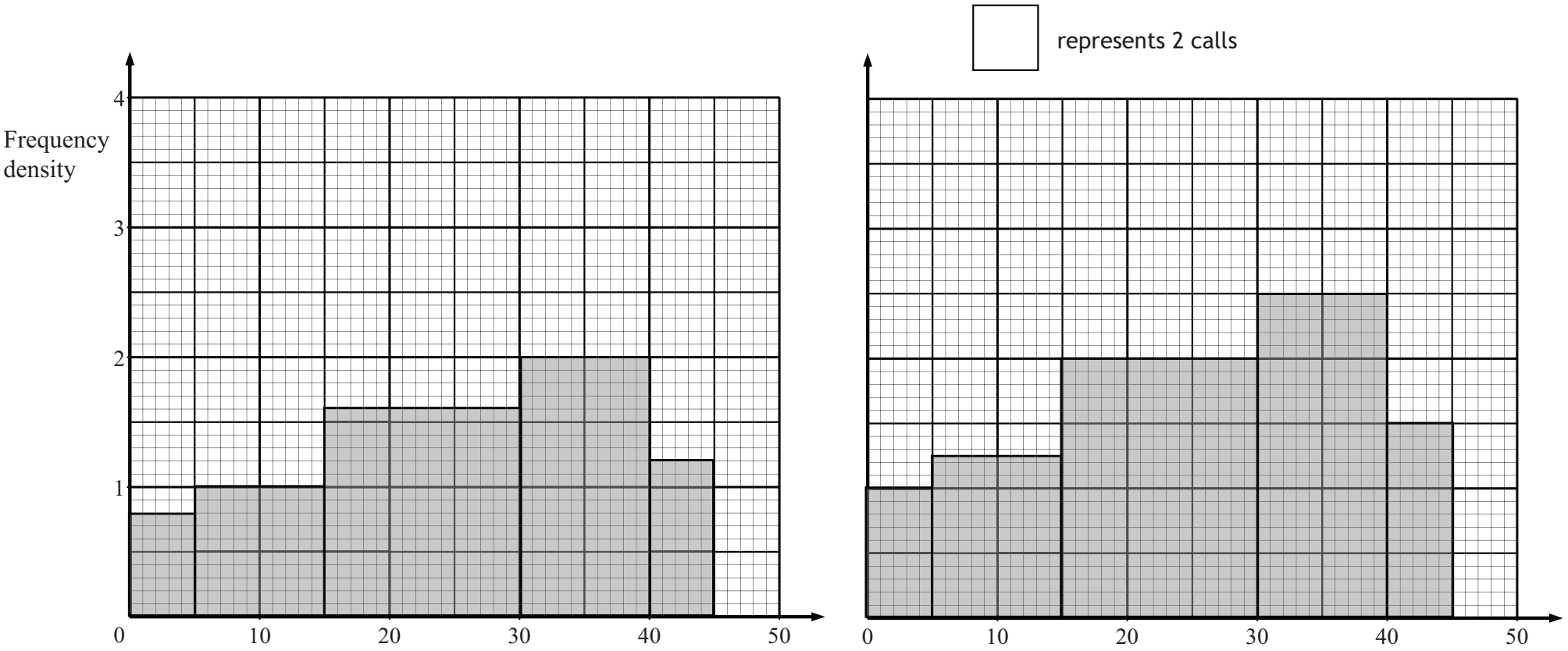
Examples: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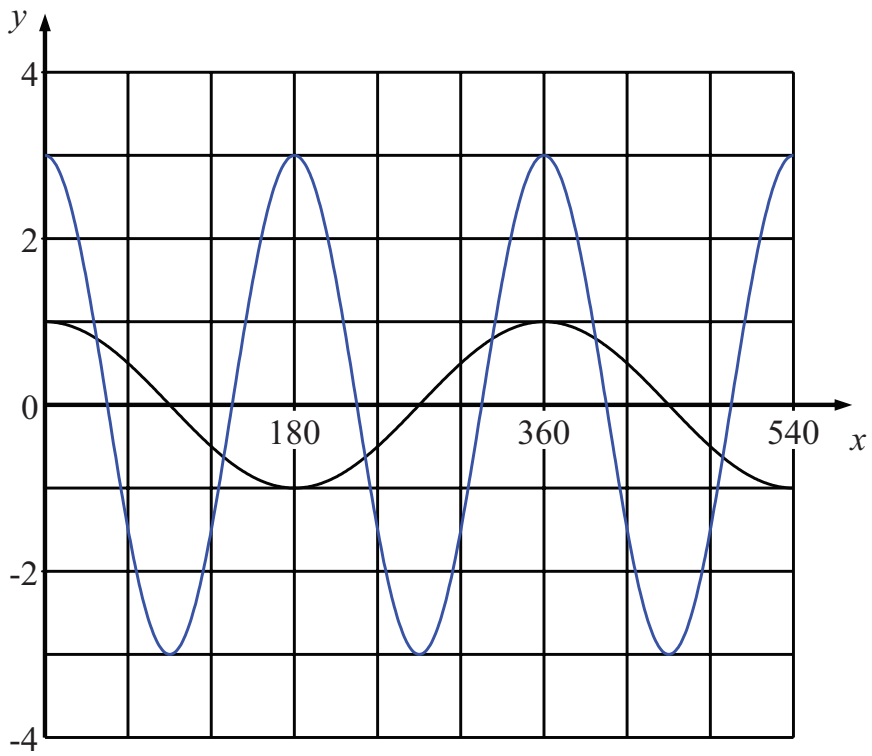
26.