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Mathematics 2381

Summer 2009

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Mark Scheme (Results)

Edexcel GCSE
Mathematics 2381

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Publication Code: UG 021513

June 2009

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5381F/5A					
Question		Working	Answer	Mark	Notes
1	(a)		35	1	B1 cao
	(b)		Warmer in Majorca Increase in temperature from Jan to Jun	2	B2 for two acceptable comparisons/ observations [B1 for one comparisons/ observation]
2	(a)	16 – 3	13	2	M1 for 16 – 3 A1 cao [3 to 16, 3 - 16 oe gets B1 if M0 scored]
	(b)		9	1	B1 cao (take care that this is not the result of an attempt to find the mean)
	(c)		10	1	B1 cao (take care that this is not the result of an attempt to find the mean)
3	(a)(i)		$\frac{90}{360}$ oe	1	B1 for $\frac{90}{360}$ oe (accept 25%or 0.25 or ¼) Condone any incorrect cancelling if correct answer is seen Do not accept 1:4 or 4:1 or 1 out of 4 or 3 in 4 etc
	(ii)		$\frac{270}{360}$ oe	1	B1 for $\frac{270}{360}$ oe (accept 75%or 0.75 or ¾) Condone any incorrect cancelling if correct answer is seen Do not accept 3:4 or 4:3 or 3 out of 4 or 3 in 4 etc SC: B1 for 1 –(a)(i) SC: B0 in (i) and B1 in (ii) for correct answers but consistent writing of probabilities incorrectly in **BOTH** parts (a)(i) **and** (a)(ii) e.g. 1 out of 4 **and** 3 out of 4

5381F/5A					
Question		**Working**	**Answer**	**Mark**	**Notes**
	(b)	(360 ÷ 30) × 6	72	2	M1 for 360÷30 o.e. e.g.30º is a twelfth or 6÷30 or 30÷6 or 1 person is 5º o.e. or sight of 12×6 or 360 ÷ 5 or attempt add 5 frequencies 3 of which are correct or any partial equivalent method A1 cao
4	(a)		15	1	B1 cao
	(b)	(1 × 11 + 3 × 12 + 0 × 13 + 2 × 14 + 4 × 15) ÷ 10 = 135 ÷ 10 = 11 + 36 + 0 + 28 + 60	13.5	3	M1 for 1 × 11 or 3 × 12 or 0 × 13 or 2 × 14 or 4 × 15 or sight of any two or more of the correct answers 11, 36 , 0, 28, 60 (must be from a product however) M1 (dep) for adding 4 or 5 of these products and dividing by 10 A1 cao [SC: B2 available for using '13 × 0 = 13' without further mistakes] giving an answer of 14.8

5381F/5B					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		3	1	B1 cao
	(b)		Estate	1	B1 cao
	(c)		$\frac{2}{4}$ oe	2	M1 for a fraction with a denominator of 4 or numerator of 2 A1 for $\frac{2}{4}$ oe (accept 0.5 or 50%) SC B1 for 2 out of 4 or 1 out of 2 B0 for 1 : 2 or 2 : 4 or 4 : 2 etc
2	(a)		Between ¼ and ½ but nearer to ½	1	B1 for a mark between ¼ and ½ but nearer to ½ than ¼
	(b)		At 0	1	B1 for a clear mark at 0 within ± 2 mm
3			<table><tr><td>Type</td><td>Tally</td><td>Frequency</td></tr><tr><td></td><td></td><td></td></tr></table>	3	B1 for Type of newspaper (or listing examples) B1 for Tally (or tally marks shown) B1 for Frequency (or Total or evidence of totalling)
4	(a)		Positive correlation, or the heavier the pike the longer it is.	1	B1 for positive correlation, or the heavier the pike the longer it is. (or equivalent) B0 for positive (relationship)
	(b)		Point plotted correctly	1	B1 for a correct plot ±1 square
	(c)		12-17 kg	2	B2 for an answer in the range 12 to 17 kg inclusive **OR** M1 for drawing a line of best fit or vertical line drawn from 65 cm A1 for an answer in the range 12 to 17 kg or ft from "line of best fit"

5381F/5B				
Question	**Working**	**Answer**	**Mark**	**Notes**
5		(g,1) (g,2) (g,3) (g,4) (g,5) (g,6) (b,1) (b,2)(b,3) (b,4) (b,5) (b,6) (r,1) (r,2) (r,3) (r,4) (r,5) (r,6)	2	B2 for a fully correct list [B1 for at least 6 correct additional outcomes] Ignore duplicates e.g. (g,1) (1, g)

5381H/6A					
Question		**Working**	**Answer**	**Mark**	**Notes**
1		(1 × 11 + 3 × 12 + 0 × 13 + 2 × 14 + 4 × 15) ÷ 10 = 135 ÷ 10 = 11 + 36 + 0 + 28 + 60	13.5	3	M1 for 1 × 11 or 3 × 12 or 0 × 13 or 2 × 14 or 4 × 15 or sight of any two or more of the correct answers 11, 36 , 0, 28, 60 (must be from a product however) M1 (dep) for adding 4 or 5 of these products and dividing by 10 A1 cao [SC: B2 available for using '13 × 0 = 13' without further mistakes] giving an answer of 14.8
2	(a)	1 − (0.35 + 0.1 + 0.3)	0.25	2	M1 for 1 − (0.35 + 0.1 + 0.3) oe A1 for 0.25 oe (accept 25%) Note:- Look for answer in the table if it's not on answer line [SC: B1 for 1 − 0.39 = 0.61, if M0 scored; 0.61 with no working gets no marks]
	(b)	0.35 + 0.1	0.45	2	M1 for 0.35 + 0.1 oe A1 for 0.45 oe [SC:B1 for an answer of 0.36 or for 0.45 seen in working followed by subtraction from 1]
	(c)	0.3 × 200	60	2	M1 for 0.3 × 200 A1 cao SC: B2 for 60 out of 200 SC: B1 for 60 in 200 or 60/ 200 or 0.3 × 200/ 4

5381H/6A				
Question	**Working**	**Answer**	**Mark**	**Notes**
3 (a)	(623+640+639)÷3	634	2	M1 for either (623+640+639)÷3 or (608+595+597)÷3 or (595+597+623)÷3 or (597+623+640)÷3 seen with no other inconsistent approach A1 cao
(b)		Increase (upwards)	1	B1 for increase or upwards trend or 'number of births went up' or 'it goes up' oe
4		Bars at 4cm, 6cm, 7cm, 8 cm and 1.5 cm in height oe with fd axis labeled correctly	3	M1 for dividing frequency by group size or sight of 0.8, 1.2, 1.4, 1.6, 0.3 (minimum 2 seen) A1 for bars of consistent areas for all given frequencies B1 for fd axis labeled correctly and consistently **Alternative scheme** B3 for bars at 4cm, 6cm, 7cm, 8 cm and 1.5 cm in height oe with fd axis labeled correctly and consistently (e.g. 1 cm fd 0.2) [B2 for bars at 4cm, 6cm, 7cm, 8cm and 1.5cm in height oe with no labeling or incorrect labeling on the fd axis OR fully and correctly labeled fd axis with one bar error] [B1 for 4th bar twice as high as 1st bar] [B0 for bar chart with unequal bars] **NB** apply the same mark-scheme if a different frequency density is used e.g. bars at 1.6 cm, 2.4 cm, 2.8 cm, 3.2 cm, 0.6 cm

5381H/6B				
Question	**Working**	**Answer**	**Mark**	**Notes**
1 (a)		Positive correlation, or the heavier the pike the longer it is.	1	B1 for positive correlation, or the heavier the pike the longer it is. (or equivalent)
(b)		Point plotted correctly	1	B1 for a correct plot ±1 square
(c)		12-17 kg	2	B2 for an answer in the range 12 to 17 kg **OR** M1 for drawing a line of best fit A1 for an answer in the range 12 to 17 kg or ft from "line of best fit"
2 (a)		$0.25 < p \leq 0.50$	1	B1 for $0.25 < p \leq 0.50$ (accept 0.25 to 0.5(0) or clearly identified on the diagram as the mode)
(b)		$0.5 < n \leq 0.75$	1	B1 for $0.5 < n \leq 0.75$ (accept 0.5(0) to 0.75 or clearly identified on the diagram as the median)
(c)		4, 13, 17, 22, 28, 29, 30	1	B1 cao
(d)		cf graph	2	B2 for a fully correct cf graph (accept ogive) [B1 for 5 or 6 consistent, correctly plotted points from a sensible cf table (increasing values) OR for a cf graph drawn through points other than the end points of each interval]
(e)		9 or 10 or 11	2	M1 for clear method to read off from a cf graph at area = 0.90, on the cf scale, can be awarded from their reading ± 1sq A1 ft for an answer of 9 or 10 or 11 [B1 for an answer in the range 9 to 11 if M0 scored]

5381H/6B				
Question	**Working**	**Answer**	**Mark**	**Notes**
3	$(\frac{4}{9} \times \frac{3}{8}) + (\frac{3}{9} \times \frac{2}{8}) + (\frac{2}{9} \times \frac{1}{8})$ $= \frac{12+6+2}{72}$	$\frac{20}{72}$ oe	4	B1 for $\frac{3}{8}$ or $\frac{2}{8}$ or $\frac{1}{8}$ seen as 2nd probability M1 for $(\frac{4}{9} \times \frac{3}{8})$ or $(\frac{3}{9} \times \frac{2}{8})$ or $(\frac{2}{9} \times \frac{1}{8})$ M1 for $(\frac{4}{9} \times \frac{3}{8}) + (\frac{3}{9} \times \frac{2}{8}) + (\frac{2}{9} \times \frac{1}{8})$ A1 for $\frac{20}{72}$ oe **Alternative scheme for replacement** B0 for $\frac{4}{9}$ or $\frac{3}{9}$ or $\frac{2}{9}$ seen as 2nd probability M1 for $(\frac{4}{9} \times \frac{4}{9})$ or $(\frac{3}{9} \times \frac{3}{9})$ or $(\frac{2}{9} \times \frac{2}{9})$ M1 for $(\frac{4}{9} \times \frac{4}{9}) + (\frac{3}{9} \times \frac{3}{9}) + (\frac{2}{9} \times \frac{2}{9})$ A0 for $\frac{29}{81}$ **Special cases** S.C. if M0 scored, award B2 for $\frac{29}{81}$ or $\frac{20}{81}$ or $\frac{29}{72}$ S.C. if M0 scored award B1 for $\frac{3}{9}$ and $\frac{2}{9}$ and $\frac{1}{9}$ **or** $\frac{3}{8}$ and $\frac{2}{8}$ and $\frac{4}{8}$ seen as second probability if B2 not scored

UNIT 2 STAGE 1 5382F PAPER 07

Question	1	2	3	4	5	6	7	8	9	10
Answer	A	A	E	C	C	D	B	C	B	C
Question	11	12	13	14	15	16	17	18	19	20
Answer	D	D	B	C	A	B	C	D	D	D
Question	21	22	23	24	25					
Answer	E	D	E	A	B					

UNIT 2 STAGE 1 5382H PAPER 08

Question	1	2	3	4	5	6	7	8	9	10
Answer	D	E	E	A	D	B	E	A	D	A
Question	11	12	13	14	15	16	17	18	19	20
Answer	E	B	D	A	A	E	A	E	D	B
Question	21	22	23	24	25					
Answer	E	A	A	E	E					

5383F/09				
Question	**Working**	**Answer**	**Mark**	**Notes**
1 (a)		25	1	B1 for 25 cao
(b)		0.2	1	B1 for 0.2 cao
(c)		$\frac{27}{100}$	1	B1 for $\frac{27}{100}$ cao
2		12	2	B2 for 12 cao (B1 for 10 or 11)
3		Diameter drawn	1	B1 for a diameter drawn
4 (a)		14	1	B1 for 14 cao
(b)	$7\times7\times7$	343	1	B1 for 343 cao
5 (a)		$3m$	1	B1 for $3m$ (accept $m3$)
(b)		y^2	1	B1 for y^2 cao
(c)		$5a+b$	2	B2 for $5a+b$ cao (B1 for $5a$ or b or $1b$)
6	$\frac{35}{100}\times240=$	84	2	M1 for $\frac{35}{100}\times240$ or 0.35×240 or 35×2.4 or 24 + 24 + 24 +12 or for any complete method. A1 for 84 cao

5383F/09				
Question	**Working**	**Answer**	**Mark**	**Notes**
7 (a)	180 – 2×52 =	76	2	M1 for 180 – '2×52' A1 for 76 cao
(b)		reason	1	B1 for isosceles or angles in a triangle sum to 180º
8	<table><tr><td>*x*</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>*y*</td><td>-5</td><td>-2</td><td>1</td><td>4</td><td>7</td></tr></table>	Straight line	3	M2 for two correct points plotted or a correct straight line which does not cover the range $x = -1$ to $x = 3$ (M1 for one point correctly plotted or calculated or a straight line through one correct point) A1 for correct line between -1 and 3 OR M1 for line with correct gradient M1 for line with correct *y* intercept A1 for correct line between -1 and 3
9	$3.4^2 - 2.6^2 = 4.8$ $4.8 \div 1.6 =$	3	2	M1 for $3.4 \times 3.4 - 2.6 \times 2.6$ with evidence of multiplication or 11.56 or 6.76 or 4.8 or 289/25 or 169/25 or 24/5 A1 for 3 cao (SC B1 for 7.335 or 1467/200)

5383F/09				
Question	**Working**	**Answer**	**Mark**	**Notes**
10	$\frac{30}{1.5} = 20$ $\frac{42}{2} = 21$	Kamala	3	M1 for $\frac{30}{1.5}$ or $\frac{42}{2}$ (accept minutes) A1 for 20 and 21 A1 for Kamala cao Note: answer only scores M0 A0 A0 **Alternative method:** M1 for 10 km in 0.5 hours A1 for 40 km in 2 hours A1 for Kamala cao **OR** M1 for 10.5 km in 0.5 hours A1 for31.5 km in 1.5 hours A1 for Kamala cao **OR** M1 for 60 km in 3 hours or 63 km in 3 hours A1 for 60 km in 3 hours and 63 km in 3 hours A1 for Kamala cao **OR** M1 for 10 km in 30 minutes or 10.5 km in 30 minutes A1 for 60 km in 30 minutes and 10.5 km in 30 minutes A1 for Kamala cao

5383H/10				
Question	**Working**	**Answer**	**Mark**	**Notes**
1	$3.4^2 - 2.6^2 = 4.8$ $4.8 \div 1.6 =$	3	2	M1 for $3.4\times3.4-2.6\times2.6$ with evidence of multiplication or 11.56 or 6.76 or 4.8 or 289/25 or 169/25 or 24/5 A1 for 3 cao (SC B1 for 7.335 or 1467/200)
2 (a)		50	1	B1 for 50 cao
(b)		Alternate (angles)	1	B1 for alternate (angles) or co-interior (angles) or allied (angles) or any complete reason. (accept Z angles)
3	<table><tr><td>x</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>-5</td><td>-2</td><td>1</td><td>4</td><td>7</td></tr></table>	Straight line	3	M2 for two correct points plotted or a correct straight line which does not cover the range $x = -1$ to $x = 3$ (M1 for one point correctly plotted or calculated or a straight line through one correct point) A1 for correct line between -1 and 3 OR M1 for line with correct gradient M1 for line with correct y intercept A1 for correct line between -1 and 3
4	$18 \times 5.8 =$	104.4	2	M1 for 18×5.8 A1 for 104.4 cao
5 (a)	$6x+9+2x+2=$	$8x+11$	2	M1 for $3\times2x+3\times3$ or $2\times x+2\times1$ or $6x+9$ or $2x+2$ or $8x$ or 11 A1 for $8x+11$ cao
(b)	$y^2+4y-3y-12$	y^2+y-12	2	M1 for 3 out of 4 terms of $y\times y+4\times y-3\times y-3\times4$ correct including signs, or 4 terms excluding signs A1 for y^2+y-12 or $y^2+1y-12$ cao

5383H/10				
Question	**Working**	**Answer**	**Mark**	**Notes**
6	$\frac{1}{2}(180-86)=47$ $90-47=$	43	2	M1 for $\frac{1}{2}(180-86)$ or 47 or for $90-'47'$ or $\frac{1}{2}(180-"94")$ A1 for 43 cao
7		1.5×10^3	2	B2 for 1.5×10^3 cao (B1 for $a\times10^3$, $a\neq1.5$ or 1.5×10^b, $b\neq3$ or 15×10^2 or 1500)
8	$x=0.1717...$ $100x=17.1717...$ $99x=17$ $x=\frac{17}{99}$ or 1000x=171.7171… 10x= 1.7171… 990x=170 x=17/99	Proof	2	M1 for valid method eg $100x = 17.17\ldots$, $1x = 0.1717\ldots$ and subtract **OR** $1000x = 171.7171..$, $10x =$ 1.7171… and subtract A1 for valid argument leading to $x=\frac{17}{99}$ **Alternative method** for long division M1 for identifying 71 and 17 as remainders A1 for correct statement
9	$\frac{\cancel{(x+1)}(2x+1)}{\cancel{(x+1)}(x-4)}=$	$\frac{(2x+1)}{(x-4)}$	3	B3 for $\frac{(2x+1)}{(x-4)}$ (B1 for $(x+1)(2x+1)$ and/ or B1 for $(x+1)(x-4)$)

5383H/10				
Question	**Working**	**Answer**	**Mark**	**Notes**
10	Mass of water = 300×1= 300g Mass of juice=15×4=60g Total mass = 360 Total volume = 315 Density = 360÷315	$1\frac{1}{7}$	3	M1 for 300×1 or 15×4 or 60 or 360 seen M1 for $\frac{'300\times1'+'15\times4'}{'300+15'}$ A1 for $1\frac{1}{7}$ oe or 1.14...

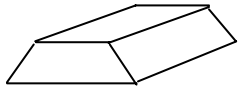
5384F/11F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1		$30-(16+9)$	5	2	M1 30 – "(16 + 9)" or "30 − 16" − 9 or "30 − 9" − 16 A1 cao
2	(a)		207	2	M1 for a valid method (condone one error) or sight of 7 (as units) in working or answer OR $'193+7'+200$ or $'193+200'+7$ A1 cao
	(b)		–5	1	B1 cao
	(c)		–15	1	B1 cao
	(d)		6	1	B1 cao
3	(a)		30	1	B1 for 30
	(b)		5	1	B1 for 5
4		(27 + 3) ÷ 2	17 15	3	B1 for output 17 M1 for (27 + 3) ÷ 2 or ← ÷2 ← +3 seen A1 for input 15 SC: B1 for input of 60 or 12 or 16.5
5	(i)		E or C	1	B1 for E or C or both
	(ii)		B	1	B1 cao
	(iii)		A	1	B1 cao
	(iv)		C or A	1	B1 for C or A or both

5384F/11F					
Question		**Working**	**Answer**	**Mark**	**Notes**
6	(a)		Edinburgh	1	B1 for Edinburgh or –7
	(b)		5	1	B1 cao
	(c)		Leeds	1	B1 for Leeds or –6 to 3 or 9 or -9
7	(a)		6	1	B1 cao
	(b)		5	1	B1 cao
	(c)		7	1	B1 cao
8	(a)		08 30	1	B1 for 08 30 oe
	(b)		17	1	B1 cao
	(c)		10 15	1	B1 for 10 15 oe
9	(a)		Diagram	2	B2 within guidelines
	(b)		90	1	B1 for an angle in range 86 to 94 **or** ft 'angle' measured correctly within $\pm 2^o$
10	(a)		45	1	B1 for 44 - 46
	(b)		60	1	B1 cao
	(c)		150	2	M1 for a complete method e.g. reading from graph at 50 euros and doubling (allow ±1mm tolerance in reading from graph) A1 for 140 – 160 SC: B2 for 200

5384F/11F					
Question		**Working**	**Answer**	**Mark**	**Notes**
11		$\frac{1}{8}+\frac{6}{8}$	$\frac{7}{8}$	2	M1 for $\frac{6}{8}$ OR correct attempt to make fractions have a common denominator with at least one fraction correct OR for 0.125 and 0.75 seen A1 for $\frac{7}{8}$ oe or 0.875
12			4	2	M1 for $\frac{20}{5}$ or $\frac{5}{20}$ or $\frac{12}{3}$ or $\frac{3}{12}$ OR 3×4 and 5×4 seen A1 cao SC: B1 for 4:1 or 1:4 oe
13		$20\times 36=720$ $4\times 36=144$ **30** **6** **20** 600 120 720 **4** 120 24 144 720 144 3 6 8 (0 6 | 1 2 / 1 2 | 2 4) 2 4 6 4	864	3	M1 for a complete method with relative place value correct. Condone 1 multiplication error, addition not necessary. M1 (dep) for addition of the appropriate elements of the calculation. [Note: Repeated addition of 24 lots of 36 (36 lots of 24) gets M1 only] A1 cao

5384F/11F					
Question		**Working**	**Answer**	**Mark**	**Notes**
14			Correct tessellation	2	B2 for at least 6 correct shapes (including initial shape) correctly tessellating (B1 for at least 4 correct shapes (including initial shape) correctly tessellating)
15		$\frac{14}{20}\times 100$	70	2	M1 for $\frac{14}{20}\times 100$ or $\frac{1400}{20}$ or 14 × 5 seen or $\frac{70}{100}$ or $\frac{7}{10}$ OR for a correct method to turn fraction into percentage OR for a correct decomposition, e.g. 10+2+2=50%+10%+10% (condone one error) A1 cao
16		$360-(120+140+58)$	42	2	M1 $360-"(120+140+58)"$ or equivalent) or for (a + 58 + 120 + 140 = 360) oe seen A1 cao [Note: The subtraction MUST be from 360]
17	(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

5384F/11F					
Question		**Working**	**Answer**	**Mark**	**Notes**
18			300, 90, 45, 225	3	M2 for any one of 200 + 100 **or** 60 + 30 **or** 30 + 15 **or** 150 + 75 **or** 300 **or** 90 **or** 45 **or** 225 seen. A1 cao or M1 for 12÷8 or $6 \div 4$ or 3 ÷ 2 or sight of 1.5 M1 for 200 × "1.5" or 60 × "1.5" or 30 × "1.5" or 150 × "1.5" A1 cao or M1 200 ÷ 8 or 25 M1 25 × 12 or 300 A1 cao or M1 200 ÷ 4 or 50 M1 50 × 6 or 300 A1 cao or M1 200 ÷ 2 or 100 M1 100 × 3 or 300 A1 cao (In any of the above methods the M marks can be awarded for equivalent calculations with 60, 30 or 150)

5384F/11F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(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)
20	(a)	$2x - 3 + x + 6 + 3x + 1$	$6x + 4$	2	M1 for $2x - 3 + x + 6 + 3x + 1$ **or** $6x + k$ seen A1 for $6x + 4$, condone $P = 6x + 4$ but not $x=6x+4$ or $0=6x+4$
	(b)	$6x + 4 = 37$ $6x = 33$ $x = 5.5$	5.5	2	M1 for "$6x + 4$" = 37, must be 3 term linear equation with coefficient of $x \neq 1$ A1 for 5.5, $\frac{11}{2}$, $5\frac{1}{2}$ oe or ft for their "$6x + 4$" provided x is positive. **OR** M1 for a correct 2 stage numerical process to find x A1 for 5.5, $\frac{11}{2}$, $5\frac{1}{2}$ oe or ft for their "$6x + 4$" provided x is positive. T&I Allow 2 marks for 5.5oe , otherwise 0 (**SC** B1 "$x + k = 37$" or "$kx = 37$) NB Do not award marks in (a) for 6x+4 in (b)

5384F/12F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		0.9	1	B1 for 0.9
	(b)		75	1	B1 for 75 cao
	(c)		$\frac{23}{100}$	1	B1 for $\frac{23}{100}$ o.e.
	(d)		10	1	B1 for 10 cao
2	(a)	5.85 + 4.90	10.75	1	B1 for 10.75
	(b)	60.55 ÷ 8.65	7	2	M1 for 60.55 ÷ 8.65 or 8.65 × 7 = 60.55 or for at least 4 repeated additions or subtractions of 8.65 A1 for 7 cao
	(c)	8.65 + (4.90 + 4.90) 20 – 18.45	1.55	3	M1 for 8.65 + (4.90 + 4.90) M1 (dep) for 20 – '18.45' A1 for 1.55 cao SC: Award B1 for sight of 18.45 or 6.45 or 10.20 Award B2 for 155
3	(i)		Cone	1	B1 for cone or alternative spellings that sound like "cone".
	(ii)		Cylinder	1	B1 for cylinder or alternative spellings that sound like "cylinder". Accept circular based prism.
4	(a)		6.4	1	B1 for 6.2 – 6.6 inclusive; accept 62-66 with mm stated.
	(b)		Midpoint marked	1	B1 for midpoint marked at 3 – 3.4 inclusive

5384F/12F				
Question	**Working**	**Answer**	**Mark**	**Notes**
5 (a)		60	1	B1 for 60 cao
(b)		reason	1	B1 for no 90º angle oe
6 (a)	$6 \times 3 + 4$	22	2	M1 for 6×3 or '6×3' + 4 or 18 seen A1 for 22, accept 22.00 or 22.0
(b)	$52 - 4 = 48$ $48 \div 6 =$	8	3	M1 for $52 - 4$ or 48 seen M1 (dep) for '$52 - 4$' $\div 6$ or $48 \div 6$ A1 for 8 cao **Alternative method:** M2 for a systematic attempt using $6 \times d + 4$ at least twice with at least one d greater than 5 with correct answers A1 for 8 cao
7 (i)	$\frac{10}{100} \times 7200$	720	2	M1 for $\frac{10}{100} \times 7200$ oe A1 (accept 720.00 or 720.0)
(ii)	$7200 - 720$	6480	1	B1 ft from (i) for $7200 -$ '720'
8		correct net	3	B3 for correct net (B2 for 5 faces drawn, all correct or 6 faces drawn with 4 or 5 faces correct (B1 for a fully correct net with 6 faces for any cuboid) Note: Accept outline only drawn
9 (a)		A and C	1	B1 c for A and C or C and A
(b)		Shape drawn	1	B1 for correct shape, any orientation or reflection, ±2 mm

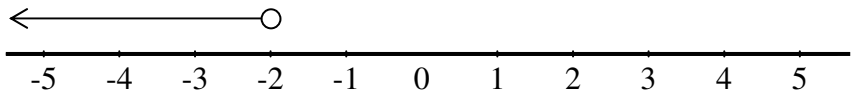
5384F/12F				
Question	**Working**	**Answer**	**Mark**	**Notes**
10 (a)		shading	1	B1 for one square shaded to get one of  or  or 
(b)		shading	1	B1 for one square shaded to get 
11	$\frac{1}{6}\times 36 = 6$ $\frac{2}{9}\times 36 = 8$ 36 – (8 + 6)	22	3	M1 for $\frac{1}{6}\times 36$ or $36\div 6$; $\frac{2}{9}\times 36$ or $36\div 9\times 2$ or 6 seen as long as not with incorrect working or 8 seen or 14 seen or $\frac{1}{6}+\frac{2}{9}$ or $\frac{7}{18}$ oe M1 (dep) for 36 – '(8+ 6)' or $36-"\left(\frac{2}{9}+\frac{1}{6}\right)"\times 36$ or $\left(1-"\frac{1}{6}+\frac{2}{9}"\right)\times 36$ A1 for 22 cao SC B2 for $\frac{22}{36}$ oe fraction

5384F/12F					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)	$1.8 \times -8 + 32$	17.6	2	M1 for 1.8×-8 or -14.4 or $\frac{-72}{5}$ seen or $32 - '1.8 \times 8'$ or $1.8 \times -8 + 32$ seen A1 for 17.6 or $\frac{88}{5}$ or 17.60 oe
	(b)	$68 = 1.8C + 32$ $1.8C = 68 - 32$ $C = 36 \div 1.8$	20	2	M1 for $68 - 32$ or 36 or $68 = 1.8C + 32$ seen; Condone replacement of C by another letter. A1 for 20 cao NB: Trial and improvement scores 0 or 2
13	(a)	325×1.68	546	2	M1 for 325×1.68 seen or digits 546 A1 for 546, accept 546.00, 546.0
	(b)	$117 \div 1.5$	78	2	M1 for $117 \div 1.5$ seen or digits 78 A1 for 78, accept 78.00, 78.0
14	(a)		Correct shape	2	B2 for correct shape; any orientation. (B1 for any two sides correct or all correct for scale factor other than 1 or 2), tolerance to within half square
	(b)		Reflection in line $x = 0$	2	B1 for reflection, reflect, reflected. B1 for line $x = 0$ or y-axis NB: More than one transformation should be awarded 0 marks.

5384F/12F				
Question	**Working**	**Answer**	**Mark**	**Notes**
15 (a)	18 ÷ 6 : 12 ÷ 6	3 : 2	2	M1 for 18 : 12 or 12 : 18 or 1.5 : 1 oe or 1:0.67 oe or correct ratio reversed eg 2 : 3 A1 for 3 : 2 or 1 : 0.666 ...[recurring]
(b)	5 + 1 = 6 54 ÷ 6 = 9 5 × 9	45	2	M1 for $\frac{5}{5+1}\times 54$ or $\frac{1}{5+1}\times 54$ or 54 ÷ '5+1' or 54 × 5 or 270 or 9 : 45 or 9 seen, as long as it is not associated with incorrect working A1 for 45 cao
16 (a)	t^{6+2}	t^8	1	B1 for t^8 or for t^{6+2}
(b)	m^{8-3}	m^5	1	B1 for m^5 or for m^{8-3}
17	(0.5 × 3.14... × 8) + 8	20.56 – 20.58	3	M2 for (0.5 × π × 8) or π × 4 or (π × 8 + 8) or (0.5 x π × 8 + 8) oe (M1 for π × 8 or 2π × 4 or for a value 25.1– 25.2 inclusive unless seen with incorrect working eg πr^2) A1 for 20.56 – 20.58 (**SC**: B2 if M0 scored for 12.56 – 12.58)

5384F/12F				
Question	**Working**	**Answer**	**Mark**	**Notes**
18 (a)		See diagram below	2	B2 for correct directed line from –2, ±2 mm and an empty circle (B1 for only one of these correct)
(b)	$5y + 10 = 4 - 7y$ $12y + 10 = 4$ $12y = -6$ $y = -\frac{1}{2}$	$-\frac{1}{2}$	3	B1 for $5y + 10$ M1 for $5y + 7y = 4 -$ "10" oe A1 for $-\frac{1}{2}$ oe **OR** M1 for $y + 2 = \frac{4-7y}{5}$ oe M1 for $y +$ "$\frac{7y}{5}$" = "$\frac{4}{5}$" – 2 oe A1 for $-\frac{1}{2}$ oe

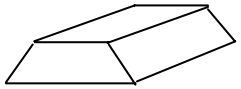
Question 18a



5384H/13H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1			300, 90, 45, 225	3	M2 for any one of 200 + 100 **or** 60 + 30 **or** 30 + 15 **or** 150 + 75 **or** 300 **or** 90 **or** 45 **or** 225 seen. A1 cao or M1 for 12÷8 or $6 \div 4$ or 3 ÷ 2 or sight of 1.5 M1 for 200 × "1.5" or 60 × "1.5" or 30 × "1.5" or 150 × "1.5" A1 cao or M1 200 ÷ 8 or 25 M1 25 × 12 or 300 A1 cao or M1 200 ÷ 4 or 50 M1 50 × 6 or 300 A1 cao or M1 200 ÷ 2 or 100 M1 100 × 3 or 300 A1 cao (In any of the above methods the M marks can be awarded for equivalent calculations with 60, 30 or 150)
2			$\frac{3}{20}$	2	M1 for clear attempt to multiply numerators and multiply denominators e.g $\frac{3\times1}{5\times4}$ or $\frac{12\times5}{20\times20}$ A1 for $\frac{3}{20}$ oe

5384H/13H					
Question		**Working**	**Answer**	**Mark**	**Notes**
3	(a)	$2x - 3 + x + 6 + 3x + 1$	$6x + 4$	2	M1 for $2x - 3 + x + 6 + 3x + 1$ **or** $6x + k$ seen A1 for $6x + 4$, condone $P = 6x + 4$ but not $x=6x+4$ or $0=6x+4$
	(b)	$6x + 4 = 37$ $6x = 33$ $x = 5.5$	5.5	2	M1 for "$6x + 4$" $= 37$, must be 3 term linear equation with coefficient of $x \neq 1$ A1 for 5.5, $\frac{11}{2}$, $5\frac{1}{2}$ oe or ft for their "$6x + 4$" provided x is positive. Or M1 for a correct 2 stage numerical process to find x A1 for 5.5, $\frac{11}{2}$, $5\frac{1}{2}$ oe or ft for their "$6x + 4$" provided x is positive. T&I Allow 2 marks for 5.5oe , otherwise 0 (SC B1 "$x + k = 37$" or "$kx = 37$) NB Do not award marks in (a) for 6x+4 in (b)
4		$20 \div 5$ (=4) $20 -$ "4" (=16) "16" $\times$ 1.50 (=24)	9	4	M1 for $20 \div 5$ M1 for $20 -$ "4" where $0 <$ "4" < 20 M1 for "16" $\times$ 1.50 where $0 <$ "16" < 20 A1 cao

5384H/13H					
Question		**Working**	**Answer**	**Mark**	**Notes**
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 N.B. If more than 1 transformation is given then award no marks'
6	(a)		7	2	M1 for $2y - 6 = 8$ or $y - 3 = \frac{8}{2}$ A1 cao
	(b)	$4x - 2x = 12 - 1$	5.5	2	M1 $4x - 2x = 12 - 1$ oe A1 5.5 oe
7		$x^2 = 72 \div 2$	6	2	M1 for 72 ÷ 2 or 36 seen A1 6 or -6 or ± 6
8	(a)		-1, -4, 4	2	B2 for all 3 values correct (B1 for 1 or 2 values correct)
	(b)			2	B1 ft for all 7 of their points correctly plotted B1 ft (dep on at least B1 in (a)) for smooth curve through all 7 of their points

5384H/13H					
Question		**Working**	**Answer**	**Mark**	**Notes**
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			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

5384H/13H					
Question		**Working**	**Answer**	**Mark**	**Notes**
11		$3x + 4y = 7$ $10x - 4y = 32$ $13x = 39$ $x = 3$ $3\times3 + 4y = 7$ $4y = -2$ $X = \frac{7-4y}{3}$ $10(\frac{7-4y}{3}) - 4y = 32$	$x = 3,\ y = -\frac{1}{2}$	3	M1 for coefficients of x or y the same followed by correct operation, condone one arithmetical error M1 (dep) for substituting found value in one equation A1 cao SC: B1 for one correct answer only if Ms not awarded **Alternative method** M1 for rearranging one equation and substituting in other to eliminate one variable(condone one arithmetical error) M1 (dep) for substituting found value in one equation A1 cao
12	(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 $t \le 5.5$ or $t \ge 5.5$ on the answer line)
	(b)		5	1	B1 for 5 or ft (a)
13	(i)		170^o	1	B1 cao
	(ii)		Reason	1	B1 for Angle at centre is twice angle at circumference (accept edge, middle, *O* origin)oe

5384H/13H					
Question		**Working**	**Answer**	**Mark**	**Notes**
14		$(x + 5)(x - 9)$	9, –5	3	M2 for $(x - 9)(x + 5)$ (M1 for $(x \pm 9)(x \pm 5)$ A1 cao 9 and –5 **OR** M1 for substitution into formula (condone incorrect signs) M1 for $\frac{4 \pm \sqrt{196}}{2}$ A1 cao **OR** M1 for $(x-2)^2 - 2^2 - 45$ (= 0) M1 for $x = 2 \pm \sqrt{4+45}$ A1 cao **OR** T&I B3 Both solutions correct (B1 One solution correct)
15	(a)		6	1	B1 for 6 or ±6
	(b)		$\frac{1}{4}$	2	M1 for $8^{\frac{1}{3}} = 2$ or $\frac{1}{8^{\frac{2}{3}}}$ or 4^{-1} or $64^{-\frac{1}{3}}$ or 2^2 or 4 or $\frac{1}{2^2}$ or 2^{-2} A1 for $\frac{1}{4}$ or 0.25 or any equivalent vulgar fraction or decimal

5384H/13H					
Question		**Working**	**Answer**	**Mark**	**Notes**
16		*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

5384H/13H					
Question		**Working**	**Answer**	**Mark**	**Notes**
17		$\frac{1}{u}=\frac{1}{f}-\frac{1}{v}$ $\frac{1}{u}=\frac{v-f}{fv}$	$u=\frac{fv}{v-f}$	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 $u=\frac{-fv}{f-v}$
18		$2\times7-2\times\sqrt{3}+7\times\sqrt{3}-\sqrt{3}\times\sqrt{3}=$ $14+5\sqrt{3}-3$	$11+5\sqrt{3}$	3	M1 for exactly 3 or exactly 4 terms correct including correct signs or all 4 terms correct with wrong signs. M1(dep) for either collecting their two or three terms in $\sqrt{3}$ or for $\sqrt{3}\times\sqrt{3}=3$ A1 cao
19		$\frac{120}{360}\times\pi\times2\times6$	4π + 12	3	M1 for $\frac{120}{360}\times\pi\times2\times6$ oe allow 3.14, 3.142, $\frac{22}{7}$ for π A1 for 4π or anything in the closed interval [12.56, 12.57], or $12\frac{4}{7}$ oe *or* $\frac{a\pi}{b}$ where a and b are integers with *a = 4b* A1 4π + 12 or π4 + 12 oe SC(B2 for a fully correct, but unsimplified expression for the perimeter, including $\left(\frac{2\pi r}{3}\right)+12$ or $\left(\frac{2\pi r}{3}\right)+2r$ Or for any value in the closed interval [24.56, 24.57])

5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)	325 × 1.68	546	2	M1 for 325 × 1.68 seen or digits 546 A1 for 546, accept 546.00, 546.0
	(b)	117 ÷1.5	78	2	M1 for 117 ÷1.5 seen or digits 78 A1 for 78, accept 78.00, 78.0
2	(a)		Correct shape	2	B2 for correct shape; any orientation. (B1 for any two sides correct or all correct for scale factor other than 1 or 2), tolerance to within half square
	(b)		Reflection in line $x = 0$	2	B1 for reflection, reflect, reflected. B1 for line $x = 0$ or y-axis NB: more than one transformation should be awarded 0 marks.
3		143.64 ÷ 19 = 7.56 7.56 × 31 =	234.36	3	M1 for 143.64 ÷ 19 (or 7.56 seen) or 143.64 × 31 (or 4452.84 seen) M1(dep) for '7.56' × 31 or '4452.84' ÷ 19 or 143.64 + 12×'7.56' A1 for 234.36 cao accept 234.36p **Alternative method:** M1 for $\frac{31}{19}$ (or 1.63(1..) seen) M1 (dep) '1.63..' × 143.64 A1 for 234.36 cao accept 234.36p

5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
4	(a)	$1.8 \times -8 + 32$	17.6	2	M1 for 1.8×-8 or -14.4 or $\frac{-72}{5}$ seen or $32 - '1.8 \times 8'$ or $1.8 \times -8 + 32$ seen A1 for 17.6 or $\frac{88}{5}$ or 17.60 oe
	(b)	$68 = 1.8C + 32$ $1.8C = 68 - 32$ $C = 36 \div 1.8$	20	2	M1 for $68 - 32$ or 36 or $68 = 1.8C + 32$ seen; condone replacement of C by another letter. A1 for 20 cao NB Trial and improvement score 0 or 2
5	(a)	$18 \div 6 : 12 \div 6$	3 : 2	2	M1 for 18 : 12 or 12 : 18 or 1.5:1 or 1:0.67 oe or correct ratio reversed eg 2:3 A1 for 3 : 2 or 1 : 0.6 ...[recurring]
	(b)	$5 + 1 = 6$ $54 \div 6 = 9$ 5×9	45	2	M1 for $\frac{5}{5+1} \times 54$ or $\frac{1}{5+1} \times 54$ or $54 \div '5+1'$ or 54×5 or 270 or 9 : 45 or 9 seen, as long as it is not associated with incorrect working. A1 for 45 cao

5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
6		<table><tr><td>2</td><td>48</td></tr><tr><td>3</td><td>87</td></tr><tr><td>2.5</td><td>65.(625)</td></tr><tr><td>2.6</td><td>69.(576)</td></tr><tr><td>2.7</td><td>73.(683)</td></tr><tr><td>2.65</td><td>71.6(09)</td></tr><tr><td>2.61</td><td>69.9(79)</td></tr><tr><td>2.62</td><td>70.3(84)</td></tr><tr><td>2.63</td><td>70.7(91)</td></tr><tr><td>2.64</td><td>71.1(99)</td></tr><tr><td>2.66</td><td>72.(021)</td></tr><tr><td>2.67</td><td>72.4(34)</td></tr><tr><td>2.68</td><td>72.8(48)</td></tr><tr><td>2.69</td><td>73.2(65)</td></tr></table>	2.6	4	B2 for trial $2.6 \leq x \leq 2.7$ evaluated (B1 for trial $2 \leq x \leq 3$ evaluated) B1 for different trial $2.6 < x \leq 2.65$ B1(dep on at least one previous B1) for 2.6 Values evaluated can be rounded or truncated, but to at least 2sf when x has 1dp and 3sf when x has 2dp **NB** Allow 72 for evaluation using $x = 2.66$ **NB** No working scores no marks even if answer is correct
7			construction	2	M1 for a pair of arcs drawn from the same centre on 2 lines at same distance from meeting point; or a single arc crossing both lines; using an arc with a radius which is the length of the shorter line will imply an intersection with the end of that line. ($\pm$ 2mm) A1 for bisector ($\pm 2^o$) and correct arcs **SC:** B1 for bisector ($\pm 2^\circ$) with no arcs, or incorrect arcs if M0 awarded. Accept bisectors that are dashed or dotted.
8		$(0.5 \times 3.14... \times 8) + 8$	20.56 – 20.58	3	M2 for $(0.5 \times \pi \times 8)$ or $\pi \times 4$ or $(\pi \times 8 + 8)$ or $(0.5 \times \pi \times 8 + 8)$ oe (M1 for $\pi \times 8$ or $2\pi \times 4$; for a value 25.1-25.2 inclusive unless seen with incorrect working eg πr^2) A1 for 20.56 – 20.58 (**SC**: B2 if M0 scored for 12.56 – 12.58)

5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
9		4.6 + 3.85 = 8.45 $3.2^2 - 6.51 = 3.73$ 8.45 ÷ 3.73 =	2.26541555	2	M1 for $\frac{169}{20}$ or $\frac{256}{25}$ or $\frac{373}{100}$ or 3.73 or 10.24 or 8.45 seen A1 for 2.265(41555); accept $\frac{845}{373}$
10	(a)	t^{6+2}	t^8	1	B1 for t^8 or for t^{6+2}
	(b)	m^{8-3}	m^5	1	B1 for m^5 or for m^{8-3}
	(c)	$2^3 \times x^3$	$8x^3$	2	B2 for $8x^3$ cao (B1 for ax^3, $a \neq 8$ or $2x \times 2x \times 2x$ or $8x^n$ $n \neq 0,3$)
	(d)	$3 \times 4 \times a^{2+5} \times h^{1+4}$	$12a^7h^5$	2	B2 for $12a^7h^5$ (B1 for $12a^7h^n$, $n \neq 0,5$ or $12a^mh^5$, $m \neq 0,7$ or ka^7h^5, $k \neq 12$ or $3 \times 4 \times a^{2+5} \times h^{1+4}$)

5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
11		$9^2 - 6^2$ $81 - 36 = 45$ $\sqrt{45}$	6.705 - 6.71	3	M1 for $9^2 - 6^2$ or 81 – 36 or 45 or $9^2 = AB^2 + 6^2$ oe M1 for $\sqrt{81-36}$ or $\sqrt{45}$ A1 for 6.705 – 6.71 [**SC:** M1 for $\sqrt{81+36}$ or $\sqrt{117}$]
12		4500×1.04^2	4867.20	3	M1 for 4500 × 1.04 or for 4500 + 0.04 × 4500 or for 4680 or 180 or 360 or 4860 M1 (dep) '4680' × 1.04 or for '4680' + 0.04 × '4680' A1 for 4867.2(0) cao (If correct answer seen then ignore any extra years) **Alternative method** M2 for 4500×1.04^2 or 4500 × 1.04^3 A1 for 4867.2(0) cao [SC: 367.2(0) seen B2]

5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
13		$\cos x = \frac{5}{8}$	51.3 – 51.35	3	M1 for $\cos(x=)\frac{5}{8}$ M1 for $\cos^{-1}\frac{5}{8}$ or $\cos^{-1}0.625$, or $\cos^{-1}(5\div 8)$ A1 for 51.3 – 51.35 (SC B2 for 0.89 – 0.9 or 57 – 57.1 seen) **Alternative Scheme** $h^2 = 8^2 - 5^2$ (=39) M1 for $\sin(x=)\ \frac{\sqrt{"39"}}{8}$ or $\tan(x=)\frac{\sqrt{"39"}}{5}$ or $\frac{\sin x}{\sqrt{"39"}} = \frac{\sin 90}{8}$ oe or $(\sqrt{"39"})^2 = 8^2 + 5^2 - 2\times 8\times 5\times\cos x$ M1 for $\sin^{-1}(\frac{\sqrt{"39"}}{8})$ or $\sin^{-1}(\frac{\sqrt{"39"}\times\sin 90}{8})$ or $\tan^{-1}(\frac{\sqrt{"39"}}{5})$ or $\cos^{-1}(\frac{8^2+5^2-(\sqrt{"39"})^2}{2\times 8\times 5})$ A1 for 51.3 – 51.35

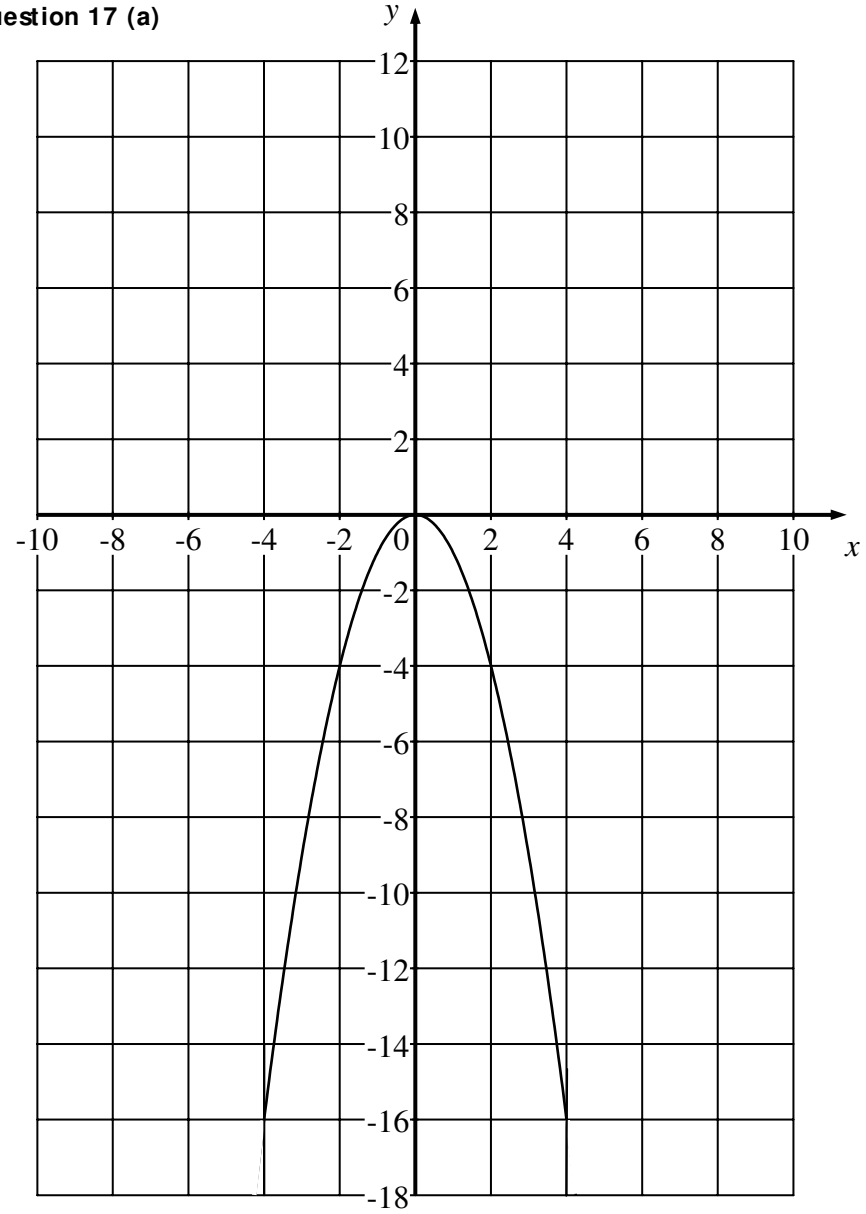
5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
14		$P = \frac{k}{d^2}$ $k = Pd^2$ = 10000 x 0.4² = 1600 when $d = 0.8$, $P = \frac{1600}{0.8^2}$	2500	3	M1 $P = \frac{k}{d^2}$ or $P \propto \frac{1}{d^2}$ M1 k = 10000 x 0.4² A1 2500 cao **OR** M1 $\frac{x}{10000} = \frac{0.4^2}{0.8^2}$ M1 $\frac{0.4^2}{0.8^2}$ x 10000 A1 2500 cao

5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
15	(a)	$x = \frac{--2 \pm \sqrt{(-2)^2 - 4\times1\times(-1)}}{2}$ $= \frac{2 \pm \sqrt{8}}{2}$ $= \frac{2 \pm 2.82843}{2}$ $x = -0.4142$ or $x = 2.4142$	−0.41, 2.41	3	M1 for substitution into formula (condone incorrect signs) M1 for $\frac{2 \pm \sqrt{8}}{2}$ A1 for −0.41 to -0.415 and 2.41 to 2.415 **OR** M1 for $(x-1)^2 - 1^2 - 1$ seen M1 for $(x-1) = \pm\sqrt{2}$ A1 for -0.41 to −0.415 and 2.41 to 2.415 T&I B3 both solutions, B1 1 solution
	(b)		−0.41, 2.41	1	B1 ft from (a)
16	(a)		**b** − **a**	1	B1 for **b** − **a** or − **a** + **b** oe
	(b)	$\overrightarrow{OP} = \overrightarrow{OA} + \overrightarrow{AP}$ $\overrightarrow{OP} = \mathbf{a} + \frac{3}{5}(\mathbf{b} - \mathbf{a})$ $\overrightarrow{OP} = \frac{1}{5}(2\mathbf{a} + 3\mathbf{b})$	proof	3	M1 for $\overrightarrow{OP} = \overrightarrow{OA} + \overrightarrow{AP}$ oe or $\overrightarrow{OP} = \overrightarrow{OB} + \overrightarrow{BP}$ oe M1 for $\overrightarrow{AP} = \frac{3}{5}$ x "(**b** − **a**)" oe or $\overrightarrow{BP} = \frac{2}{5}$ x "(**a** − **b**)" oe A1 for **a** + $\frac{3}{5}$ x (**b** − **a**) oe or **b** + $\frac{2}{5}$ x (**a** − **b**) oe leading to given answer with correct expansion of brackets seen

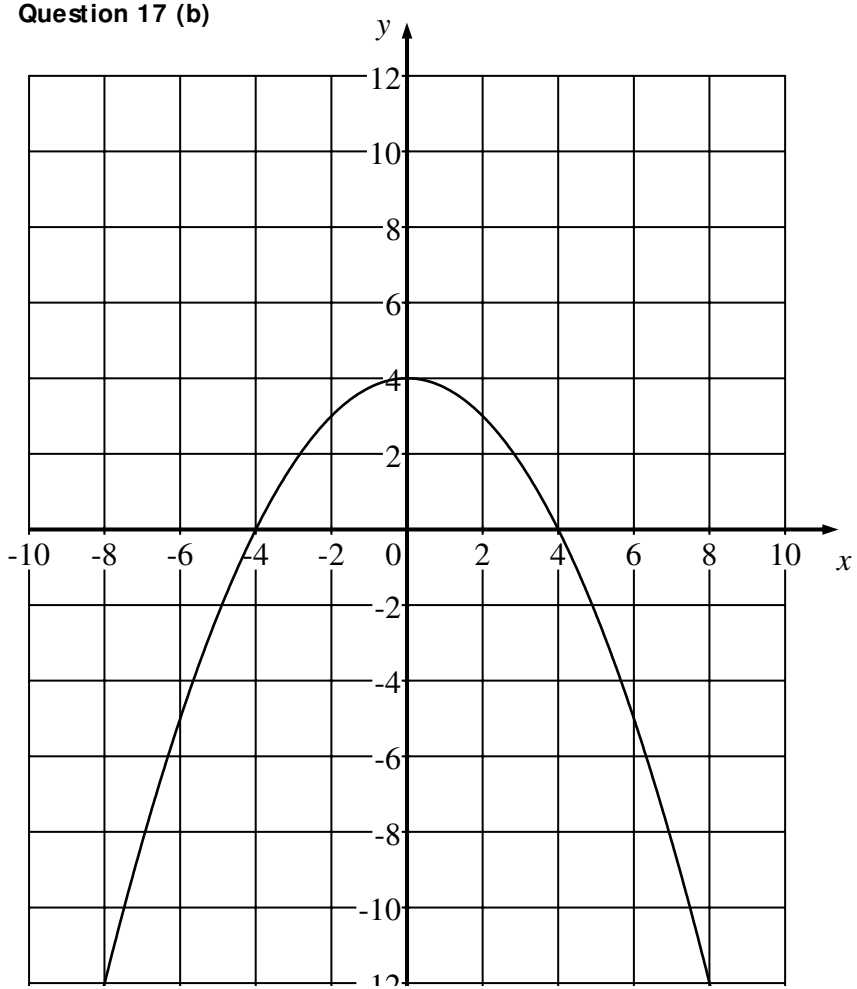
5384H/14H					
Question		**Working**	**Answer**	**Mark**	**Notes**
17	(a)		Curve	2	B2 parabola max (0,0), through (−2, −4) and (2, −4) Tol ½sq (B1 parabola with single maximum point (0,0) or through (−2, −4) and (2, −4),but not both or the given parabola translated along the y-axis by any other value than -4 –the translation must be such that the points (0,4), (-2,0), (2,0) are translated by the same amount. Tol ½sq)
	(b)		Curve	2	B2 parabola max (0,4), through (−4, 0) and (4,0) Tol ½sq (B1 parabola with single maximum point (0,4)) Tol ½sq

PTO for graphs for Q17

Question 17 (a)



Question 17 (b)



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