November 2010

1380/4H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1		$5 \times 8 \div 2$	20	2	M1 for $5 \times 8 \div 2$ oe A1 cao
2		$1 - 0.58 - 0.3$ $= 1 - 0.88$	0.12	2	M1 for $1 - 0.58 - 0.3$ oe A1 for 0.12 oe
3		B = 20×2 = 40 C = $3 \div 4 \times 20$ = 15 D = $10 \div 100 \times 20 + 20$ = 22 20 + 40 + 15 + 22	97	4	M1 for 20×2 or 40 seen M1 for $3 \div 4 \times 20$ or 15 seen M1 for $10 \div 100 \times 20 + 20$ oe or 22 seen or 1.1×20 A1 cao
4	(a)	3×100	300	2	M1 for 3×100 or $100 \div 6 \times 18$ oe A1 cao
	(b)	$2 \div ½ \times 6$	24	2	M1 for $2 \div ½ \times 6$ oe A1 cao

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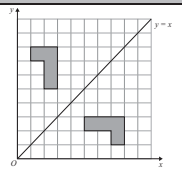
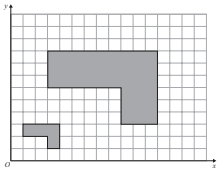
5	(a)			2	B2 cao (B1 for shape in the correct orientation above the line y = *x* or for shape elongated or shortened by one square but with either top or bottom in the correct position and in the correct orientation)
	(b)			3	B3 for correct enlargement in correct position (B2 for enlargement SF 3 in incorrect position or enlargement, centre *O*, but different scale factor) (B1 for 4 lines enlarged by SF 3 or enlargement, not from *O*, different scale factor)
6	(a)		$6x + 5y$	2	B2 (B1 for either $6x$ or $5y$ seen)
	(b)	$2x = 10 - 3 = 7$ $x = 7 \div 2$	3.5	2	M1 for $2x = 10 - 3$ or $2x = 7$ or $(10 - 3) \div 2$ A1 for 3.5 oe
	(c)(i)		c^{11}	2	B1 accept c^{5+6}
	(ii)		e^{8}		B1 accept e^{12-4}

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Question	**Working**	**Answer**	**Mark**	**Notes**
7	8 ÷ 20 × 100	40	2	M1 for 8 ÷ 20 × 100 or $\frac{8}{20}=\frac{8\times5}{20\times5}$ oe or $\frac{40}{100}$ A1 cao
8 (a)		10 to 19	1	B1 cao
(b)		20 to 29	1	B1 for acceptable reason eg correct answer is 20 to 29 eg $30^{th}/31^{st}$ person not in this interval
(c)			2	B2 for complete polygon (ignore histograms and any lines below an age of 4.5 or above an age of 65, but award B1 if there is a line joining the first to the last point.) (B1 for one vertical or horizontal error OR incorrect but consistent error in placing the midpoints horizontally OR correct plotting but not joined. In this case ignore a line joining the first to the last.) Plotting tolerance: ± 1 square Points to be joined by lines (ruled or handdrawn, but not curves.)

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Question	**Working**	**Answer**	**Mark**	**Notes**
9		2.42927(0474)	2	B2 for 2.42927 or better (B1 for 19.56 or 8.0518 seen or 2.43 or 2.429 or 2.4292 or 2.4293 or digits 242927… or $\frac{97800}{40259}$ seen)
10 (a)		$-2, -1, 0, 1, 2$	2	B2 for $-2, -1, 0, 1, 2$ (B1 for one extra or one missing)
(b)	$2x < 30$	$x < 15$	2	M1 for $2x < 30$ or $\frac{x}{3} < 5$ or $x = 15$ or $x > 15$ A1 cao
11		A and 3 B and 2 C and 4 D and 1	2	B2 for all 4 correct (B1 for 2 correct)
12		$T = 7x + 5y$	3	B3 for $T = 7x + 5y$ oe (B2 for $7x + 5y$ oe or $T = 7x + …$ or $T = … + 5y$) (B1 for T = an expression in x and y or $7x$ or $5y$ seen)
13	$7120 \div 8$	890	2	M1 for 7120 ÷ 8 or 7120 ÷ 480 A1 cao

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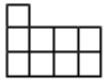
Question		**Working**	**Answer**	**Mark**	**Notes**
14	(a)			2	B2 for correct front elevation (B1 for the correct diagram with extra row or extra column) Internal lines need not be drawn
	(b)			2	B2 for correct plan - it can be rotated (B1 for any rectangle that is not a square) Internal lines need not be drawn
15	(a)		Reason	1	B1 for valid reason eg only best students, biased, sample is too small
	(b)		Wrong	1	B1 for valid thing wrong eg the choices are all positive, question does not reference liking
	(c)		Question	2	B1 for one question which includes a time frame or reference to 'normal' homework B1 for at least 3 valid non-overlapping boxes, need not be inclusive NB response boxes must be intervals but allow 0 on its own
16	(a)		(0, 3, 2)	1	B1 cao
	(b)		(5, 3, 0)	1	B1 cao
17	(a)	8.25×10^7	8.25×10^7	1	B1 cao
	(b)	$= 14.56 \times 10^{-16}$	1.456×10^{-15}	2	M1 for digits 1456×10^n or $A \times 10^{-15}$, $1 < A < 2$ A1 for 1.456×10^{-15}

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Question		**Working**	**Answer**	**Mark**	**Notes**
18		19.5 × 1000 ÷ 210 = 19500 ÷ 210 = 92.8(5714…) or 92 × 210 = 19320 = 19.32 *l* 93 × 210 = 19530 = 19.53 *l* or 19500 ÷ 92 = 211.95 19500 ÷ 93 = 209.67	Explanation	3	M1 for converting between m*l* and *l* correctly or for 0.21 or 19500 seen M1 for "19500" ÷ "210" or 92 × "210" or 93 × "210" or "19500" ÷ 92 A1 for a worded explanation with correct calculations
19	(a)		61, 82, 94, 100	1	B1 cao
	(b)		Points plotted and joined	2	B2 ft (dep on sensible table - condone 1 addition error) for 5 points plotted correctly, ± 1 square, at ends of interval **and** joined by curve or line segments provided no gradient is negative – ignore any part of graph outside range of their points (B1 ft for 4 points plotted correctly **and** joined or for 5 points plotted correctly) (SC B1 if 5 points plotted not at end but consistent within each interval **and** joined)

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Question		**Working**	**Answer**	**Mark**	**Notes**
19	(c)		36 – 38	1	B1 for answer in range 36 – 38 or ft (± 1square) from cf graph using cf = 50 or 50.5
	(d)		9 – 11	2	B2 for answer in range 9 – 11 OR M1 ft from cf graph for valid reading (± 1square) from 56 or 57 or vertical line drawn from age = 56 or 57 and horizontal line drawn to '*y*'-axis A1 ft (± 1square) for 100 – "reading from 56 or 57"
20	(a)	2) 56 2) 28 2) 14 7	$2 \times 2 \times 2 \times 7$	2	M1 for a systematic method of at least 2 correct divisions by a prime number oe factor tree, can be implied by digits 2, 2, 2, 7 on answer line A1 for $2 \times 2 \times 2 \times 7$ or $2^3 \times 7$
	(b)	$42 = 2 \times 3 \times 7$	14	2	M1 for attempt to find the common factor (by 2 lists or otherwise) or for answer of 7 A1 cao

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Question	**Working**	**Answer**	**Mark**	**Notes**
21	$AB = 8 \cos 37° = 8\ (0.7986\ldots)$ $= 6.389\ldots$	6.39	3	M1 for cos37 = $\frac{AB}{8}$ M1 for $AB = 8 \cos 37°$ or 6.4 seen (dep on 1st M1) A1 for 6.38 - 6.39 OR M1 for $\frac{AB}{Sin53} = \frac{8}{Sin90}$ M1 for $AB = \frac{8Sin53}{Sin90}$ AB or 6.4 seen (dep on 1st M1) A1 for for 6.38 - 6.39 SC M2A0 for 6.12 (radians) or 6.69 (grad)
22 (a)		−15, (−8), −7, −6, 1, (20)	2	B2 for all 4 correct (B1 for 2 or 3 correct)
(b)			2	B2 for fully correct graph OR B1 ft for 6 'points' plotted correctly ± 1square B1 for smooth curve through all their 5 or 6 plotted points provided B1 awarded in (a)

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Question		**Working**	**Answer**	**Mark**	**Notes**
23		Angle *ADC* = 180 − 128 = 52° *x* = 2 × 52° or Reflex angle *AOC* = 256° *x* = 360 − 256	104	2	M1 for valid method to get angle *ADC* or 128 × 2 or 256° seen … can be on the diagram A1 cao
24		35.5 × 26.5	940.75	3	B1 for sight of 35.5 or 26.5 or 35.4999(…) or 26.4999(…) M1 for UB length × UB width where 35.49 ≤ UB length ≤ 35.5 26.49 ≤ UB width ≤ 26.5 A1 for 940.74 - 940.75 (or $\frac{3763}{4}$)
25	(a)	$(2x + 4y)(4x - 5y)$ $= 8x^2 - 10xy + 16xy - 20y^2$	$8x^2 + 6xy - 20y^2$	2	B2 cao (B1 for 3 out of 4 terms correct or all 4 correct ignoring signs)
	(b)		$x + 10$	1	B1 for $x + 10$ or $(x + 10)$ or $(x + 10)^1$
	(c)	$= \frac{(x+5)(x-5)}{(x+5)(x+2)}$	$\frac{x-5}{x+2}$	3	M1 for $(x+5)(x-5)$ M1 (indep) for $(x+5)(x+2)$ A1 cao
	(d)	$x^2 + 6x - 2 = (x + 3)^2 - 9 - 2$	$p = 3$ $q = -11$	2	M1 for $(x + 3)^2 \pm k$ or $x^2 + 2px + p^2 + q$ oe or $p = 3$ or $q = -11$ A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
26		$\frac{7}{11}\times\frac{4}{10}+\frac{4}{11}\times\frac{7}{10}$ $=\frac{28}{55}+\frac{28}{55}$	$\frac{28}{55}$	3	M1 for $\frac{4}{10}$ and $\frac{7}{10}$ as second probabilities, may be seen on a tree diagram, or for $\frac{7}{11}\times\frac{4}{10}$ or $\frac{4}{11}\times\frac{7}{10}$ M1 (dep) for $\frac{7}{11}\times\frac{"4"}{10}+\frac{4}{11}\times\frac{"7"}{10}$ A1 for $\frac{28}{55}$ oe SC B2 for an answer of $\frac{56}{121}$ oe
27	(a)	Graph translated 3 units to the right through points (1, 6), (7, 6), (2, 0), (6, 0), (4, –2.5)	sketch	2	M1 for a horizontal translation with at least three of the points (–1, 0), (3, 0), (1, –2.5) translated by the same amount A1 for a curve through the points (1, 6), (7, 6), (2, 0), (6, 0), (4, –2.5) ± ½ square
	(b)	Graph reflected in the *x*-axis through points (–1, 0), (3, 0), (1, 2.5), (–2, –6), (4, –6)	sketch	2	M1 for a reflection in *x*-axis through (–1, 0), (3, 0) or in *y*-axis through (0, –2) A1 for a curve through the points (–1, 0), (3, 0), (1, 2.5), (–2, –6), (4, –6) ± ½ square

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28	(a)	Area = ½ (8.3 × 10.5) sin 62° = 43.575 × 0.88294… = 38.47444136	38.5	2	M1 for ½ (8.3 × 10.5) sin 62° A1 for 38.4 – 38.5 SC M1A0 for ±32.2 (radians) or 36.0 (grad)
	(b)	$QR^2 = 8.3^2 + 10.5^2$ $- 2(8.3)(10.5) \cos 62$ $= 68.89 + 110.25$ $- 174.3 \times 0.46947…$ $= 179.14 - 81.828…$ $QR = \sqrt{97.3111…}$ = 9.86463920	9.86		M1 for correct substitution into cosine rule M1 (dep) for correct order of evaluation (excluding square root) A1 for 9.86 – 9.865 SC M2A0 for 7.86 (radians) or 9.01 (grad)