November 2009

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		173160	1	B1 cao
	(b)		173.16	1	B1 cao
2		$\frac{30 \times 5}{0.2} = 150 \div 0.2 = 750$	750–775	3	M1 For correct roundings to 1 sig fig of two or three of the figures or consistent multiples e.g 150, or 155 or two of 30, 5, 0.2 or $\frac{31\times500}{20}$ or $\frac{30\times500}{20}$ or $\frac{30\times500}{21}$ Or A1 for any correct approximate expression which would give the answer after one operation e.g $\frac{150}{0.2}$ or $\frac{155}{0.2}$ or 150×5 or 30×25 or 31×25 or 155×5 or $\frac{1500}{2}$ A1 750–775 Do not accept attempts at full working out

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
3	(a)		–2,(0,2),4,6,8	2	B2 for all 4 correct values of y (B1 for 2 or 3 correct values of y)
	(b)		Line	2	B2 for correct straight line between $x = –2$ and $x = 3$ (B1 for a line which passes through (0, 2), or a line with gradient 2, or at least 4 points from their table plotted correctly)
	(c) (i)		–1	1	B1 for y=–1, or ft x=–1.5 from any portion of a straight line segment.
	(ii)		2.5	1	B1 for x=2.5, or ft y=7 from any portion of a straight line segment.
4	(a)		Enlarged P	2	B2 any correct enlargement (B1 at least one side drawn to a sf of 3) tol $\frac{1}{2}$ sq (B1 correct enlargement by SF ≠ 3)
	(b)	Triangle at (2,–1),(3,–1),(2,–3)	Rotated Q	3	B3 fully correct (B2 correct orientation in correct quadrant or 90° anticlockwise about O) (B1 any rotation about O OR correct orientation in incorrect quadrant). SC B1 If Q is plotted correctly in all 4 quadrants then award

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)	3 | 3 8 7 4 | 6 1 4 5 | 4 1 5 1 5 2 6 | 0 2 3	3| 3 7 8 4| 1 4 6 5| 1 1 2 455 6| 0 2 3	3	M1 for unordered diagram (condone one error, eg an omitted value or an incorrect value or a duplicated value or a misplaced value) A1 cao B1 for key (eg 4 | 6 = 46, 30 | 6 = 36)
	(b)		$\frac{10}{15}$	2	M1 numerator of 10 ft table or for denominator of 15 A1 $\frac{10}{15}$ oe
6	(a)		Polygon	2	B2 Fully correct polygon. Points plotted at the midpoint ±2mm (B1 All points plotted accurately not joined, or one error in plotting but joined) or all points plotted accurately with first joined to last, or all points at the correct heights and consistently within or at the ends of the intervals and joined (Includes joining last to first to make a polygon)). NB: ignore polygon before 1st point, and after last point. Ignore any histograms.
	(b)		$20 < t \leq 30$	1	B1 $20 < t \leq 30$ or ft from graph..Accept any unambiguous description of the correct interval e.g 20 – 30

<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>7</td><td>(a)</td><td>$\frac{3}{8}+\frac{1}{4}=\frac{3}{8}+\frac{2}{8}=$

Or

<table><tr><td></td><td>1</td><td>4</td></tr><tr><td>3</td><td>XXXX</td><td>12</td></tr><tr><td>8</td><td>8</td><td>32</td></tr></table>
8 + 12 = 20</td><td>$\frac{5}{8}$</td><td>2</td><td>M1 Use of common denominator: $\frac{1}{4}$ as $\frac{2\times1}{2\times4}$ or writing both fractions with a common denominator other than 8 with at least one of the fractions correct.

OR 0.375 + 0.25
A1 $\frac{5}{8}$ Accept 0.625 only
Or
M1 for sight of the addition table and 8 + 12 (= 20)

A1 $\frac{5}{8}$</td></tr>
<tr><td></td><td>(b)</td><td>$\frac{2}{3}\times\frac{4}{5}=\frac{2\times4}{3\times5}=\frac{8}{15}$</td><td>$\frac{8}{15}$</td><td>2</td><td>M1 for multiplying numerator and denominator of $\frac{2}{3}$ and $\frac{4}{5}$ OR 0.66(..)×0.8 OR 0.67 ×0.8 oe
A1 for $\frac{8}{15}$ oe OR for 0.533..</td></tr>
</table>

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
7	(c)	423 12 ×12 ×423 4230 4800 846 240 5076 36 5076 4 2 3 0/4 0/2 0/3 1 0/8 0/4 0/6 2 400 20 3 4000 200 30 10 800 40 6 2 4000+200+30+800+40+6=5076	5076	3	M1 for a complete method with relative place value correct. Condone 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation A1 cao M1 for a complete grid with not more than 1 multiplication error, addition not necessary. M1 (dep) for addition of all the appropriate elements of the calculation A1 cao M1 for sight of a complete partitioning method, condone 1 multiplication error, addition not necessary. M1 (dep) for addition of the all the appropriate elements of the calculation A1 cao M2 for repeated addition, exactly 12 A1 cao

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		Reasons	2	1st aspect: time frame 2nd aspect: overlapping boxes (eg.'the 5 is in two places' 'the amounts overlap') 3rd aspect: not exhaustive (eg no <£1, other) Award B2 for 2 aspects, B1 for 1 aspect
	(b)		Any 2 of 1st, 2nd and 3rd aspects	2	1st aspect: one question or responses which includes a time frame 2nd aspect: at least 3 non-overlapping response boxes; need not be inclusive of all. 3rd aspect ; Allow for inclusion of (£)0 or use of phrase 'bigger than' oe with at least 3 response boxes Award B2 for two aspects, B1 for one aspect NB response boxes must be intervals but allow 0 on its own for the 3rd aspect

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
9	(a)	(5×5)×6	150 cm^2	4	M1 for attempt to find the area of one face (eg 5×5 or 25) M1 for 6 faces with an intention to add A1 cao B1 (indep) for cm^2 (with or without numerical answer) NB Do not accept any calculation which should lead to 125
	(b)	125 × 10 × 10 × 10 or 50 × 50 × 50	125 000	2	M1 125×10^3 (oe) or 50^3 (oe) A1 cao
	(c) (i)		86.5	1	B1 cao for 86.5
	(ii)		87.5	1	B1 for 87.5, or $87.4\dot{9}$ or 87.499… (min with dots) or 87.49 with some indication of recurrence

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)		$2a + 7c$	2	B2 for $2a + 7c$ (B1 for $2a$ or $7c$)
	(b)		$2y^2 - 3y$	1	B1 $2y^2 - 3y$ or $2\times y^2 - 3\times y$
	(c)		$x(x-4)$	2	B2 $x(x-4)$ or $(x+0)(x-4)$ condone omission of final bracket (B1 x(linear in x) condone omission of final bracket) (B1 for $x-4$)
	(d)	$2x + 6$ or $6x - 3$	$8x + 3$	2	B2 $8x + 3$ (B1 for $2x + 6$ or $6x - 3$)
	(e)		$\frac{2}{3}$	2	M1 for expansion of brackets or division by 3 A1 $\frac{2}{3}$ oe
11	(a)		060°	1	B1 $(0)57^o - (0)62^o$
	(b)		Cross C	2	B1 cross 4 cm (±0.2cm) from B B1 cross 160° (±2°) from B [SC: B1 cross 4cm and 160° from A)

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
12			$N=4p+20b$	3	B3 for $N=4p+20b$ oe (B2 $4p+20b$ as an expression not in a formula Or $N=k+20b$ oe or $N=4p+k$ oe $k \neq 0$) (B1 for $N= cp + db$, c and d numerical and not both zero Or $k+20b$ oe or $4p+k$ oe any $k\neq 0$) SC B2 for $N = 4p+20b$ subsequently incorrectly simplified SC B2 for $kN = 4p+20b$ $(k \neq 1)$ SC B1 for $4p+20b$ subsequently incorrectly simplified SC B1 for $N = 4p$ (space)$20b$ or $N = 4p \times 20b$
13	(a)		2.13×10^{5}	1	B1 cao
	(b)		1.23×10^{-3}	1	B1 cao (SC If both numbers are written correctly to 2 Sig fig then award B0,B1)
14	(a)		1	1	B1 cao
	(b)		$\frac{1}{2}$	1	B1 oe Accept 0.5
15	(a)		–1,0,1,2	2	B2 cao (–1 each error or omission)
	(b)	$5y \geq 10$	5 $y \geq 2$	2	M1 for $5y \geq 10$, condone use of = sign or > A1 for $y \geq 2$ oe as final answer [SC: B1 for 2 or $\frac{10}{5}$ seen if M0 as an answer]

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
16		$5q + 5p = 4 + 8p$ $5q = 4 + 8p - 5p$ $5q = 4 + 3p$ $q = \frac{4 + 3p}{5}$	$q = \frac{4 + 3p}{5}$	3	M1 for expansion of bracket or $5q + 5p$ or each term $\div 5$ M1 for correct process to $aq = bp + c$, a, b and c numbers A1 $q = \frac{4 + 3p}{5}$ oe [SC B2 for ambiguous answer eg $4+3p/5$]
17	(a)		50	1	B1 cao
	(b) (i)		Explanation	1	B1 Comparison of medians, or quartiles or spot points eg highest, lowest, median, etc. Allow 'average' for median
	(ii)		Explanation	1	B1 Comparison of IQR, or range . Allow 'dispersion or spread' Comparison of skewness NB: (b) could be ft from (a)
18	(a)		55° Reason	2	B1 cao B1 Angle between tangent & radius, diameter (is 90°) OR alternate segment theorem
	(b)		55° Reason	2	B1 cao or ft (a) providing the answer is $< 90^o$ B1 Angle in a semicircle or angle subtended by a diameter (is 90°) OR alternate segment theorem

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)	$\frac{5}{7},\frac{2}{7};\frac{5}{7},\frac{2}{7}\ \frac{5}{7},\frac{2}{7}$		2	B1 for $\frac{5}{7},\frac{2}{7}$ on LH branch B1 for $\frac{5}{7},\frac{2}{7}\ \frac{5}{7},\frac{2}{7}$ on RH branch
	(b)	$\frac{5}{7}\times\frac{2}{7}+\frac{5}{7}\times\frac{2}{7}$ $=\frac{10}{49}+\frac{10}{49}=\frac{20}{49}$	$\frac{20}{49}$	3	M1 for "$\frac{5}{7}\times\frac{2}{7}$" alone M1 for addition of two products from correct braches eg "$\frac{5}{7}\times\frac{2}{7}+\frac{5}{7}\times\frac{2}{7}$" A1 $\frac{20}{49}$ oe Alternative: M2 for an attempt to evaluate $1-\frac{5}{7}\times\frac{5}{7}-\frac{2}{7}\times\frac{2}{7}$ A1 cao SC $\frac{5}{7}\times\frac{2}{6}+\frac{2}{7}\times\frac{5}{6}=\frac{20}{42}$ gets B2
20		$4x+y=-1$ $12x+3y=-3$ $\underline{4x-3y=7}$ $\underline{4x-3y=7}$ $4y=-8$ $16x=4$ $y=-2$ $x=1/4$	$x=\frac{1}{4}$ $y=-2$	3	M1 for correct process to eliminate either x or y (condone one arithmetic error) M1 (dep on previous M1) for substituting found value into an appropriate equation, or further elimination A1 cao

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
21		$(2+\sqrt{3})(2-\sqrt{3})$ $= 4-2\sqrt{3}+2\sqrt{3}-\sqrt{3}\sqrt{3}$ $= 4-3$	1	2	M1 for all 4 terms correct ignoring signs or 3 out of 4 terms with correct signs.or correct use of difference of 2 squares A1 cao (SC M1 for $4-2\sqrt{3}+2\sqrt{3}$)
22	(a)		$\mathbf{b} - \mathbf{a}$	1	B1 cao
	(b)	$OP = OA + AP$ $= OA + \frac{2}{3} AB = \underline{\mathbf{a}} + \frac{2}{3}(\underline{\mathbf{b}} - \underline{\mathbf{a}})$	$\frac{1}{3}\mathbf{a} + \frac{2}{3}\mathbf{b}$	3	M1 for $\vec{OP} = \vec{OA} + \vec{AP}$ or $\vec{OP} = \vec{OB} + \vec{BP}$ M1 for $\vec{AP} = k(\mathbf{b} - \mathbf{a})$ ft from (a) with $0 < k < 1$ or $\vec{AP} = \frac{2}{3}\vec{AB}$ or $\vec{BP} = k(\mathbf{a} - \mathbf{b})$ ft from (a) with $0 < k < 1$ or $\vec{BP} = \frac{1}{3}\vec{BA}$ A1 for $\frac{1}{3}\mathbf{a} + \frac{2}{3}\mathbf{b}$ oe (must be in its simplest form)

1380/3H					
Question		**Working**	**Answer**	**Mark**	**Notes**
23		$x = 0.363636\ldots$ $100x = 36.363636\ldots$ $99x = 36$ $x = \frac{36}{99} = \frac{4}{11}$ or $10000x = 3636.36\ldots$ $9999x = 3636$ $x = \frac{3636}{9999} = \frac{4}{11}$ or $9900x = 3600$ etc	Proof	3	M1 for $100x = 36.363636\ldots$ or $10000x = 3636.3636..$ M1 (dep) for subtraction of both sides A1 for $\frac{36}{99} = \frac{4}{11}$ from correct proof. OR M1 starts long/short division of 11 into 4, set out correctly, with 0.36 seen on the top of the bus stop (oe) with a remainder of 7 M1(dep) Remainder of 4 after the remainder of 7 seen in correct place A1 At least 2 remainders of 4 and one of 7 seen in the correct place and with a statement that the decimal will recur with a cycle length 2 because the remainders have a cycle length 2.
24	(a)		(5,–4)	2	B2 for (5,–4) (B1 for (a,–4) or (5,b) where $a \neq 5$ or 3 and $b \neq -4$).
	(b)		(–2,2)	2	B2 for (–2,2) (B1 for (a,2) or (–2,b) where $a \neq -2$ and $b \neq 2$).
25		Let n be any integer Then a pair of consecutive integers are n and $n + 1$ Their sum = $2n + 1$ Since n is an integer $2n$ is even so $2n + 1$ is odd	Proof	3	M1 Sight n and $n+1$ or $n - 1$ and n M1 sight of $2n+1$ oe A1 explanation of $2n+1$ eg 'it's odd' 'it's one more than an even number' (n must have been defined as an integer to earn the A1)