<table>
<tr><th colspan="5">1MA1 Practice Tests Set 1: Paper 1H (Regular) mark scheme – Version 1.0</th></tr>
<tr><th colspan="2">Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>1.</td><td></td><td>
54
24
216
1080
1296

<table>
<tr><td></td><td>5</td><td>4</td><td></td></tr>
<tr><td>1</td><td>1 / 0</td><td>/ 8</td><td>2</td></tr>
<tr><td>2</td><td>2 / 0</td><td>1 / 6</td><td>4</td></tr>
<tr><td></td><td>9</td><td>6</td><td></td></tr>
</table>

<table>
<tr><td></td><td>50</td><td>4</td></tr>
<tr><td>20</td><td>1000</td><td>80</td></tr>
<tr><td>4</td><td>200</td><td>16</td></tr>
</table>

1000 + 200 + 80 + 16 = 1296

<table>
<tr><td>5</td><td>0.4</td><td></td></tr>
<tr><td>1</td><td>0.08</td><td>0.2</td></tr>
<tr><td>0.2</td><td>0.016</td><td>0.04</td></tr>
</table>

1 + 0.2 + 0.08 + 0.016 = 1.296
</td><td>1.296</td><td>3</td><td>
M1 for a complete method with relative place value correct. Condone 1 multiplication error, addition not necessary.

OR

M1 for a complete grid. Condone 1 multiplication error, addition not necessary.

OR

M1 for sight of a complete partitioning method, condone 1 multiplication error. Final addition not necessary.

A1 for sight of digits 1296(00...)
A1 (dep on M1, but not previous A1) for correct placement of decimal point in their product.

[SC:B2 for digits 1296(00...) seen if M0 scored]
</td></tr>
</table>

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Question		**Working**	**Answer**	**Mark**	**Notes**
2.			$71.5 \leq H < 72.5$	2	B1 71.5 B1 72.5

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Question		**Working**	**Answer**	**Mark**	**Notes**
3.		$6 \times 10 \times 8 = 480$ $480 \div (6 \times 20) =$	4	3	M1 for $6 \times 10 \times 8$ or 480 seen M1 (dep) for '480' $\div (6 \times 20)$ oe A1 cao **OR** M1 for $20 \div 10$ (=2) or $10 \div 20$ ($=\frac{1}{2}$) or $\frac{8}{20}$ oe or $\frac{20}{8}$ oe M1 (dep) for $8 \div$ '2' or $8 \times \frac{1}{2}$ or $\frac{8}{20} \times 10$ oe or $10 \div \frac{20}{8}$ A1 cao SC : B2 for answer of 16 coming from $\frac{20 \times 8 \times 6}{10 \times 6}$ oe

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Question		**Working**	**Answer**	**Mark**	**Notes**
4.		0.38×10^{-1}, 3800×10^{-4}, 0.038×10^{2}, 380	Correct order	2	M1 changing any one correctly or at least 3 in the correct order (ignoring one) or reverse order A1 for correct order (accept any form)
5.	(a)	(4,0) (3, 0) (3, –1) (2, –1) (2, 2) (4, 2)	Correct position	2	B2 for correct shape in correct position (B1 for any incorrect translation of correct shape)
	(b)		Rotation 180° (0,1)	3	B1 for rotation B1 for 180° (ignore direction) B1 for (0, 1) OR B1 for enlargement B1 for scale factor −1 B1 for (0, 1) (NB: a combination of transformations gets B0)
6.	(a)	$\frac{(x+2)^2}{x+2} = \frac{(x+2)}{1}$	$x + 2$	1	B1 $x + 2$ or $\frac{(x+2)}{1}$
	(b)		$6a^5b^2$	2	B2 cao (B1 exactly 2 out of 3 terms correct in a product or a^5b^2 or $6a^{2+3}b^{1+1}$)

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Question		**Working**	**Answer**	**Mark**	**Notes**
7.		180 ÷ 9 × 1:180 ÷ 9 × 3:180 ÷ 9 × 5 = 20:60:100 Not enough cement (but enough sand and enough gravel) OR 1 × 15:3 × 15:5 × 15 =15:45:75 15 + 45 + 75 = 135 (< 180) Not enough cement (to make 180kg of concrete)	No + reason	4	M1 for 180 ÷ (1 + 3 + 5) (= 20) or 3 multiples of 1: 3: 5 M1 for 1 × ”20” or 3 × ”20” or 5 × ”20” or 20 seen or 60 seen or 100 seen A1 for (Cement =) 20, (Sand =) 60, (Gravel) = 100 C1 ft (provided both Ms awarded) for not enough cement oe OR M1 for (1 × 15 and) 3 × 15 and 5 × 15 or 9 × 15 or sight of the numbers 15, 45, 75 together. M1 for ‘15’ + ‘45’ + ‘75’ A1 for 135 (< 180) C1 ft (provided both Ms awarded) for not enough cement oe

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Question		**Working**	**Answer**	**Mark**	**Notes**
8.			25	4	M1 for 600 ÷ 4 (=150) M1 for 4500 ÷ "150" (=30) M1 for 750 ÷ "30" A1 for 25 with supporting working OR M1 for 4500 ÷ 750 (= 6) or 750 ÷ 4500 (= $\frac{1}{6}$) M1 for 600 ÷ 4 (=150) or 600 ÷ "6" (=100) or 600 × "$\frac{1}{6}$" (= 100) M1 for "150" ÷ "6" or "100" ÷ 4 or 150 × "$\frac{1}{6}$" A1 for 25 with supporting working OR M1 for 4500 ÷ 750 (=6) or 750 ÷ 4500 (= $\frac{1}{6}$) M1 for $\frac{1}{4} \times \frac{1}{6}$ $\left(= \frac{1}{24}\right)$ M1 for "$\frac{1}{24}$" × 600 A1 for 25 with supporting working

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Question		**Working**	**Answer**	**Mark**	**Notes**
9.	(a)		15 – 19	1	B1 for 15 – 19 oe (e.g. 15 to 19)
	(b)		Frequency polygon through (2, 8), (7, 11), (12, 9), (17, 14) and (22, 18)	2	B2 for a complete and correct polygon (ignore any histograms, any lines below a mark of 2 or above a line of 22, but award B1 only if there is a line joining the first to last point) (B1 for one vertical or one horizontal plotting error OR for incorrect but consistent error in placing the midpoints horizontally (accept end points of intervals) OR for correct plotting of mid-interval values but not joined) Plotting tolerance $\pm \frac{1}{2}$ square Points to be joined by lines (ruled or hand-drawn but not curves)
10.		$5q + 5p = 4 + 8p$ $5q = 4 + 8p - 5p$ $5q = 4 + 3p$ $q = \frac{4+3p}{5}$	$q = \frac{4+3p}{5}$	3	M1 for expansion of bracket or $5q + 5p$ or each term ÷ 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 e.g. $\frac{4+3p}{5}$]

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Question		**Working**	**Answer**	**Mark**	**Notes**
11.	(a)	$x^2 - 3x + 5x - 15$	$x^2 + 2x - 15$	2	M1 for four correct terms with or without signs, or 3 out of no more than 4 terms with correct signs. The terms may be in an expression or in a table A1 cao
	(b)	$(x + 9)(x - 1) = 0$	$x = 1$ or $x = -9$	3	M2 for $(x + 9)(x - 1)$ (M1 for $(x \pm 9)(x \pm 1)$) A1 cao
		OR $a = 1, b = 8, c = -9$ $x = \frac{-8 \pm \sqrt{8^2 - 4 \times 1 \times -9}}{2 \times 1}$ $= \frac{-8 \pm \sqrt{100}}{2}$			OR M1 for correct substitution in formula of 1, 8, ±9 M1 for reduction to $\frac{-8 \pm \sqrt{100}}{2}$ A1 cao
		OR $(x + 4)^2 - 16 - 9$ $(x + 4)^2 = 25$ $x = -4 \pm \sqrt{25}$			OR M1 for $(x + 4)^2$ M1 for $-4 \pm \sqrt{25}$ A1 cao SC: if no marks score then award B1 for 1 correct root, B3 for both correct roots.

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Question		**Working**	**Answer**	**Mark**	**Notes**
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 $t \leq 5.5$ or $t \geq 5.5$ on the answer line)
	(b)		5	1	B1 for 5 or ft (a)
13.			54	3	M1 for any correct use of distance, speed, time formulae, e.g. 10 ÷ 40 (= 0.25) or 15 min M1 (dep) for a complete method to find speed from G to H, e.g. 18 ÷ (35 – "15") × 60 oe A1 cao
14.		$M = kL^3$ $k = \frac{M}{L^3} = \frac{160}{8} = 20$ Where $L = 3$, $M = 20 \times 3^3$	540	4	M1 for $M \propto L^3$ $M = kL^3$ A1 $k = 20$ M1 for '20' × 3^3 A1 for 540 cao
15.	(a)		25 16	2	M1 for correct use of frequency density to find a unit of area (for example 1 cm^2 = 2.5 or 1 small square = 0.1) or the area of one block. A1 cao
	(b)		Correct black (1cm high between 40 and 60)	1	B1 for correct black
16.	(a)		7	1	B1 for 7 (accept –7 or ±7)

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Question		**Working**	**Answer**	**Mark**	**Notes**
	(b)		$3\sqrt{5}$	1	B1 cao
17.			Proof	3	M1 for (x =) 0.04545(...) or 1000x = 45.4545(...), accept 1000x = $45.\dot{4}\dot{5}$ or 100x = 4.54545(...), accept 100x = $4.\dot{5}\dot{4}$ or 10x = 0.4545(...) ,accept 10x = $0.\dot{4}\dot{5}$ M1 for finding the difference between two correct, relevant recurring decimals for which the answer is a terminating decimal A1 (dep on M2) for completing the proof by subtracting and cancelling to give a correct fraction e.g. $\frac{45}{990}=\frac{1}{22}$ or $\frac{4.5}{99}=\frac{1}{22}$
18.			Vertices at (–6, 7) (–3 , 7) (–3, 1)	3	B3 fully correct (B2 correct orientation **and** correct size **or** two correct vertices) (B1 correct size **or** correct orientation **or** one correct vertex)

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Question		**Working**	**Answer**	**Mark**	**Notes**
19.		Vertices at (–2, –4), (–4, –4), (–4, –6), (–2, –5)	Correct diagram	3	M1 for a similar shape in the correct orientation in the third quadrant M1 for an image in the correct orientation of the correct size A1 cao
20.		Gradient of $AB = 2$ Gradient of perpendicular line $= -\frac{1}{2}$ $y = -\frac{1}{2}x + c$ $-1 = -\frac{1}{2} \times 5 + c$ $c = \frac{3}{2}$	$y = -\frac{1}{2}x + \frac{3}{2}$	4	M1 for attempt to find gradient of AB M1 (dep) for attempt to find gradient of perpendicular line eg use of $-1/m$ M1(dep on M2) for substitution of $x = 5$, $y = -1$ A1 for $y = -\frac{1}{2}x + \frac{3}{2}$ oe
21.	(a)		Circle, centre O, radius 3	2	M1 for a complete circle centre (0, 0) A1 for a correct circle within guidelines
	(b)		$x = 2.6$, $y = -1.6$ or $x = -1.6$, $y = 2.6$	3	M1 for $x + y = 1$ drawn M1 (dep) ft from (a) for attempt to find coordinates for any one point of intersection with a curve or circle A1 for $x = 2.6$, $y = -1.6$ **and** $x = -1.6$, $y = 2.6$ all ± 0.1

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Question		**Working**	**Answer**	**Mark**	**Notes**
22.	(a)	$\left(\frac{8}{4}\right)^2 \times 80$	320	2	M1 for $\left(\frac{8}{4}\right)^2$ *or* $\left(\frac{4}{8}\right)^2$ A1 for 320 cao
	(b)	$\left(\frac{4}{8}\right)^3 \times 600$	75	2	M1 for $\frac{1}{'\left(\frac{8}{4}\right)'} \times 600$ A1 for 75 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
23.		$DE = AE$, and $AE = EB$ (tangents from an external point are equal in length) so $DE = EB$ $AE = EC$ (given) Therefore $AE = DE = EB = EC$ So $DB = AC$ If the diagonals are equal and bisect each other then the quadrilateral is a rectangle. **OR** If $AE = DE = EB = EC$ then there are four isosceles triangles ADE, AEB, BEC, DEC in which the angles DAB, ABC, BCD, CDA are all the same. Since $ABCD$ is a quadrilateral this makes all four angles 90°, and $ABCD$ must therefore be a rectangle.	Proof	4	B1 for $DE = AE$ or $AE = EB$ (can be implied by triangle AED is isosceles or triangle AEB is isosceles or indication on the diagram) OR tangents from an external point are equal in length B1 for $AE = DE = EB = EC$ B1 for $DB = AC$, (dep on B2) OR consideration of 4 isosceles triangles in $ABCD$ C1 fully correct proof. Proof should be clearly laid out with technical language correct and fully correct reasons

National performance data taken from Results Plus

Qu	Spec	Paper	Session YYMM	Qu	Topic	Max score	Mean % all	ALL	A*	A	B	C	D	E
1	2544	14H	0806	Q02	Four operations	3	45	1.35	2.80	2.28	1.50	0.84	0.44	0.36
2				NEW	Bounds	2				No data available				
3	1MA0	1H	1206	Q12	Volume	3	37	1.11	2.55	1.74	1.12	0.75	0.48	0.36
4	1MA0	1H	1211	Q20	Standard form	2	60	1.20	1.91	1.80	1.61	1.20	0.73	0.46
5	1MA0	1F	1306	Q26	Translations	5	24	1.20				2.57	1.63	1.04
6	1380	1H	1203	Q15cd	Simplify expressions	3	54	1.62	2.80	2.46	1.98	1.33	0.74	0.45
7	1MA0	1H	1211	Q13	Ratio	4	44	1.76	3.77	3.45	2.78	1.60	0.61	0.16
8	1MA0	1H	1411	Q14	Ratio	4	31	1.23	3.63	3.20	2.46	1.34	0.65	0.24
9	1380	1H	1006	Q08	Frequency diagrams	3	51	1.53	2.63	2.13	1.49	0.96	0.56	0.34
10	1380	1H	0911	Q16	Rearranging equations	3	44	1.33	2.88	2.57	1.70	0.77	0.32	0.11
11	1380	1H	1011	Q23	Solve quadratic equations	5	36	1.82	4.62	3.60	2.22	1.07	0.43	0.17
12	1380	1H	0906	Q20	Solve inequalities	3	50	1.51	2.87	2.40	1.51	0.64	0.18	0.06
13	1MA0	1H	1506	Q14	Compound measures	3	34	1.03	2.58	1.94	1.30	0.64	0.23	0.09
14	1380	1H	0906	Q21	Direct and inverse proportion	4	45	1.81	3.88	3.27	1.62	0.51	0.10	0.03
15	2540	1H	0811	Q23	Histograms and grouped frequency	3	20	0.60	2.63	1.56	0.56	0.23	0.19	0.18
16	2540	1H	0811	Q25	Index notation	2	21	0.41	1.83	1.16	0.48	0.12	0.03	0.02
17	1MA0	1H	1506	Q21	Recurring decimals	3	22	0.66	2.57	1.69	0.67	0.16	0.04	0.01
18	5MM1	1H	1306	Q22	Enlargement	3	25	0.74	2.33	1.20	0.50	0.14	0.06	0.06
19	1MA0	1H	1303	Q24	Selection with and without replacement	5	16	0.79	4.43	2.96	1.10	0.22	0.04	0.01
20	2MB01	2H	1211	Q16	Equations of lines	4	22	0.86	2.94	2.15	0.73	0.20	0.01	0.02
21	1380	1H	1011	Q28	Graphs of circles	5	12	0.60	3.57	1.24	0.38	0.11	0.03	0.02
22	2540	1H	0806	Q24	Congruence and similarity	4	15	0.60	2.95	0.94	0.19	0.06	0.04	0.03
23	2MB01	2H	1103	Q16	Proof	4	2	0.07		No grade data available				
						80								