1MA1 Practice papers Set 2: Paper 1H (Regular) mark scheme – Version 1.0				
Question	Working	Answer	Mark	Notes
1.	$(7 \times 2 + 2 \times 5) \times 200 =$ 4800 4800×8	38 400 g	5	M1 for 7×2 or 2×5 or 7×7 or 5×5 or 2×2 M1 for '7×2' + '2×5' (or equivalent) or '7×7' – '5×5' M1(dep on first M) for '24' × 200 or '0.0024' × 2 M1 for '4800' × 8 or '0.0048' × 8 000 000 or '0.0048' × 8000 A1 for 38 400g or 38.4kg (SC B3 for any answer including digits 384)
2. (a)		13:30	M1 M1 A1	$90 \div 1.5$ (= 60) $240 \div 60$ (= 4 hours)
(b)		Assumption and effect	C1	e.g. assumed constant speed – if not constant than could arrive earlier or later Assumed no stops – if stop then will arrive later

Question	Working	Answer	Mark	Notes
3.	$4000 - (\dfrac{10}{100} \times 4000) =$ 3600 $3600 - (\dfrac{10}{100} \times 3600)$	3240	3	M1 for $4000 - \dfrac{10}{100}$ or 0.9×4000 (or equivalent) or 3600 or 400 or 3200 or 800 seen M1 (dep) 10 "3600" $- \dfrac{10}{100} \times$ "3600" or "3600"× 0.9 (or equivalent) A1 cao **or** M2 for 29.04000 × 0.9^2 (M1 for 4000 × 0.9^3) A1 cao [SC: B2 for an answer of £4840, with or without working]

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

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5.		20	3	M1 for 30×14 (=420) or 18×10 (=180) M1 for $30 \times 14 - 18 \times 10$ or "420" – "180" (=240) A1 cao
6.	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)
7.	$6 + 3 = n + 5$ OR $64 \times 8 = 32 \times 2^{n}$	4	2	M1 for $6 + 3 - n = 5$ (or equivalent) or $(64 \times 8) \div 2^{n} = 32$ (or equivalent) or 2^{6+3} (or equivalent) seen A1 cao
8.	$-3 \leq y < 2.5$	$-3, -2, -1, 0, 1, 2$	3	M1 for dividing a list of integers by 2 or for $y \geq -3$ and/or $y < \dfrac{5}{2}$ seen or implied A2 for all integers correct (A1 for 5 correct with no more than one extra)

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9.	HCF: The numbers must be 3*n* and 3*m* where *n* and *m* are co-prime and at most one is a multiple of 3 LCM: Factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18, 36	9, 12	2	B2 cao (B1 for two numbers with HCF of 3 or LCM of 36)
10.		Vertices at (3, 2), (3, 4) and (4, 2)	3	M1 for centre (2, 0) marked M1 for all sides × ½ A1 cao SC B2 for correct enlargement from (2, 0), scale factor $\neq 0.5$ or for correct enlargement from (0, 2), scale factor = 0.5

Question		Working	Answer	Mark	Notes
11.	(a)	F: 15, 25, 36, 24; Fd: 3, 5, 3.6, 1.2	Correct histogram	3	B3 for fully correct histogram (overlay) (B2 for 3 correct blocks) (B1 for 2 correct blocks of different widths) SC : B1 for correct key, eg. 1 cm^2 = 5 (cars) **or** correct values for (freq ÷ class interval) for at least 3 frequencies (3, 5, 3.6, 1.2)
	(b)	$\frac{3}{4} \times 24$	18	2	M1 for $\frac{3}{4} \times 24$ (= 18) (or equivalent) **or** $\frac{1}{4} \times 24$ (= 6) (or equivalent) A1 cao **OR** M1 ft histogram for 15 × "1.2" **or** 5 × "1.2" A1 ft

The table in (a) working:

F	15	25	36	24
Fd	3	5	3.6	1.2

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12. (a)	$\dfrac{(x+4)(x-1)}{(2x-3)(x-1)}$	$\dfrac{x+4}{2x-3}$	3	M1 for $(x+4)(x-1)$ M1 for $(2x-3)(x-1)$ A1 cao
(b)	$\dfrac{4(x-2)}{(x+2)(x-2)}+\dfrac{3(x+2)}{(x+2)(x-}$	$\dfrac{7x-2}{(x+2)(x-2)}$	3	M1 for denominator $(x+2)(x-2)$ (or equivalent) **or** x^2-4 M1 for $\dfrac{4(x-2)}{(x+2)(x-2)}$ (or equivalent) **or** $\dfrac{3(x+2)}{(x+2)(x-2)}$ (or equivalent) (NB. The denominator must be $(x+2)(x-2)$ **or** x^2-4 **or** another suitable common denominator) A1 for $\dfrac{7x-2}{(x+2)(x-2)}$ **or** $\dfrac{7x-2}{x^2-4}$ SC: If no marks awarded then award B1 for $\dfrac{4(x-2)}{x^2-2}+\dfrac{3(x+2)}{x^2-2}$ (or equivalent)
13.		75π	3	M1 for $(4\times\pi\times 5^2)\div 2$ (or equivalent) M1 for $\pi\times 5^2$ (or equivalent) A1 for 75π (accept 235.5)

Question	Working	Answer	Mark	Notes
14.	$\dfrac{8}{20} \times \dfrac{12}{19} + \dfrac{12}{20} \times \dfrac{8}{19}$ $\dfrac{8}{20} \times \dfrac{12}{20} + \dfrac{12}{20} \times \dfrac{8}{20} =$ $= \dfrac{192}{400} \ (= 0.48)$ OR $1 - (\dfrac{8}{20} \times \dfrac{7}{20} + \dfrac{12}{20} \times \dfrac{11}{20})$ $= \dfrac{212}{400} \ (= 0.53)$	$\dfrac{192}{380}$	4	B1 for $\dfrac{8}{19}$ or $\dfrac{12}{19}$ M1 for $\dfrac{8}{20} \times \dfrac{12}{19}$ or $\dfrac{12}{20} \times \dfrac{8}{19}$ M1 for $\dfrac{8}{20} \times \dfrac{12}{19} + \dfrac{12}{20} \times \dfrac{8}{19}$ or $2 \times \dfrac{8}{20} \times \dfrac{12}{19}$ A1 for $\dfrac{192}{380}$ (or equivalent) **With replacement** M1 for $\dfrac{8}{20} \times \dfrac{12}{20}$ or $\dfrac{12}{20} \times \dfrac{8}{20}$ M1 for $\dfrac{8}{20} \times \dfrac{12}{20} + \dfrac{12}{20} \times \dfrac{8}{20}$ or $2 \times \dfrac{8}{20} \times \dfrac{12}{20}$ OR M1 for $\dfrac{8}{20} \times \dfrac{7}{20} + \dfrac{12}{20} \times \dfrac{11}{20}$ M1 for $1 - \dfrac{188}{400}$

Question	Working	Answer	Mark	Notes
15.		Correct proof	4	M1 expands $(n-1)^2$ with at least three out of four terms correct **or** $n^2 - n - n + 1$ **or** $n^2 - 2n + 1$
				M1 $n^2 - 1 + n^2 - n - n + 1$ **or** $2n^2 - 2n$
				A1 $2(n^2 - n)$ **or** $2n(n-1)$
				C1 (dep on M1) for conclusion $2 \times '(n^2 - n)'$ or $2 \times n \times '(n-1)'$ is always even
				OR
				M1 factorises $n^2 - 1$ correctly $(n-1)(n+1)$
				M1 $(n-1)(n+1+n-1)$
				A1 $2n(n-1)$
				C1 (dep on M1) for conclusion $2 \times '(n^2 - n)'$ or $2 \times n \times '(n-1)'$ is always even

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Question		Working	Answer	Mark	Notes
16.	(a)	$AB = AC$ (equilateral triangle) AD is common $ADC=ADB$ (= 90° given) $ADB ADC \Delta \equiv \Delta$ (RHS) OR $DAC = DAB$ (since ACD $= ABD$ and $ADC = ADB$) $AB = AC$ (equilateral triangle) AD is common $ADB ADC \Delta \equiv \Delta$ (SAS) OR $DAC = DAB$ (since ACD $= ABD$ and $ADC = ADB$) AD is common $ACD = ABD$ (equilateral triangle) $ADB ADC \Delta \equiv \Delta$ (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

Question		Working	Answer	Mark	Notes
16.	(b)	$BD = DC$ (congruent Δs) $BC = AB$ (equilateral Δs) Hence $BD = \dfrac{1}{2} AB$	Proof	2	B1 for $BD = DC$ and $BC = AB$ B1 for justification of these statements and completion of proof
17.	(a)	$\dfrac{6}{\sqrt{5}} \times \dfrac{\sqrt{5}}{\sqrt{5}}$	$\dfrac{6\sqrt{5}}{5}$	2	M1 $\dfrac{6}{\sqrt{5}} \times \dfrac{\sqrt{5}}{\sqrt{5}}$ A1 cao
	(b)	$2\sqrt{5} + \sqrt{10}\,\sqrt{5} +$ $2\sqrt{20} + \sqrt{10}\,\sqrt{20}$ $2\sqrt{5} + \sqrt{50} +$ $2\sqrt{20} + \sqrt{200}$ $2\sqrt{5} + 5\sqrt{2} +$ $4\sqrt{5} + 10\sqrt{2}$	$6\sqrt{5} + 15\sqrt{2}$	4	M1 for 3 of no more than 4 correct terms of expansion, (may be shown in a table or without + signs) $2\sqrt{5} + \sqrt{10}\,\sqrt{5} + 2\sqrt{20} + \sqrt{10}\,\sqrt{20}$ (or equivalent) M1 or $\sqrt{50}$ or $\sqrt{(10 \times 5)}$ or $\sqrt{200}$ or $\sqrt{(20 \times 10)}$ M1 $5\sqrt{2}$ or $10\sqrt{2}$ or $4\sqrt{5}$ A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
18.	(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
19.	(a)	$P = \dfrac{k}{V} : 5 = \dfrac{k}{8} ; k = 40$	$P = \dfrac{40}{V}$	3	M1 for $P \propto \dfrac{1}{V}$ **or** $P = \dfrac{k}{V}$, k algebraic M1 for subs $P = 5$ and $V = 8$ into $P = \dfrac{k}{V}$ A1 for $P = \dfrac{40}{V}$
	(b)	$P = \dfrac{40}{2}$	20	1	B1 ft on k for $P = \dfrac{'k'}{V}$
20.	(i)		$(3, -1)$	3	B1 cao
	(ii)		$(1.5, -4)$		B1 for $(1.5, -4)$ accept 1.5 or $1\dfrac{1}{2}$ or $\dfrac{3}{2}$ for x coordinate
	(iii)		$(-3, -4)$		B1 cao

Question	Working	Answer	Mark	Notes
21.			4	M1 for method to find gradient of AB, e.g. $\dfrac{6-0}{1--3}\left(=\dfrac{3}{2}\right)$
				M1 for method to find gradient of line, e.g. $-1 \div \dfrac{3}{2}\left(=-\dfrac{2}{3}\right)$
				M1 for method to find y intercept, e.g. $2 = -\dfrac{2}{3} \times 5 + c$ or $c = \dfrac{16}{3}$
		$3y + 2x = 16$		A1

National performance data taken from Results Plus

Qu No	Spec	Paper	Session	Qu	Topic	Max score	Mean % all	ALL	A*	A	B	C	D	E
1	1380	1F	1106	Q29	Compound measures	5	10	0.52				1.25	0.58	0.27
2				NEW	Speed	4				No data available				
3	1380	1H	1006	Q19	Compound interest	3	70	2.09	2.90	2.65	2.20	1.59	0.96	0.58
4	1MA0	1H	1411	Q14	Ratio	4	31	1.23	3.63	3.20	2.46	1.34	0.65	0.24
5	1MA0	1H	1511	Q13	Derive expressions	3	8	0.23	2.42	1.67	0.87	0.22	0.08	0.05
6	1MA0	1H	1211	Q20	Standard form	2	60	1.20	1.91	1.80	1.61	1.20	0.73	0.46
7	5MM1	1H	1211	Q18	Index laws	2	70	1.40	1.81	1.90	1.57	1.20	1.20	0.00
8	1387	5H	711	Q14	Solve inequalities	3	63	1.89	2.83	2.47	1.73	0.76		
9	5MM1	1H	1211	Q11	HCF and LCM	2	39	0.77	1.81	1.00	0.62	0.49	0.33	0.00
10	5MM1	1H	1211	Q22	Enlargement	3	52	1.56	2.81	2.42	1.70	0.57	0.00	0.00
11	1MA0	1H	1206	Q22	Histograms and grouped frequency	5	27	1.34	4.31	2.98	1.36	0.39	0.09	0.02
12	1MA0	1H	1206	Q23	Simplify algebraic expressions	6	17	1.03	4.84	2.39	0.70	0.12	0.03	0.01
13	1MA0	1H	1303	Q23	Surface area	3	17	0.50	2.05	1.21	0.68	0.33	0.12	0.03
14	5MM1	1H	1211	Q21	Selection with or without replacement	4	34	1.36	3.38	2.90	1.25	0.45	0.13	0.00
15	5MM1	1H	1306	Q23	Algebraic proof	4	20	0.79	3.00	1.30	0.36	0.04	0.00	0.00
16	1380	1H	906	Q24	Geometric proof	5	11	0.53	2.25	0.97	0.26	0.07	0.02	0.01
17	5MM1	1H	1111	Q22	Surds	6	32	1.89	5.25	3.44	1.54	0.20	0.07	0.00
18	1380	1H	1011	Q28	Graphs of circles	5	12	0.60	3.57	1.24	0.38	0.11	0.03	0.02
19	1380	1H	1011	Q26	Direct and inverse proportion	4	15	0.58	3.33	1.52	0.35	0.05	0.01	0.01
20	1MA0	1H	1411	Q25	Transformation of functions	3	6	0.17	2.01	1.15	0.39	0.09	0.03	0.01
21				NEW		4				No data available				
						80								