1MA1 Practice papers Set 6: Paper 3F (Regular) mark scheme – Version 1.0				
Question	**Working**	**Answer**	**Mark**	**Notes**
1	10 ÷ 1.4 = 7.142857143..	7	2	M1 for 10 ÷ 1.4 or 7.1(42857…) or 7 lots of 1.4 A1 cao
2 (a)	A 10 + 7 – 4 = 13 B 10 ÷ 2 + 7 = 12	Machine A with supportive working	3	M1 for 17 – 4 (= 13) or 5 + 7 (= 12) A1 for 13 and 12 C1ft (dep on M1 and two suitable answers to compare) Machine A gives the greater answer
(b)		+ 6 or × 1.75	1	B1 for + 6 or × 1.75
3 (a)		12	1	B1 cao
(b)		14	1	B1 cao
(c)		16	1	B1 cao
4 (a)		50	2	M1 for 1 kg = 1000g or 1 ÷ 20 (=0.05) A1 cao
(b)		70	3	M1 for 5000/20 (= 250) or for 250 /100 (= 2.5) or for 5000/2000 (= 2.5) M1 for 28 × "2.5" A1 cao Note: calculations may be carried out in kg or in g.

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Question	Working	Answer	Mark	Notes
5	S = 3 × 11 – 25 S = 8 E = 33 + 8 E = 41 **Or** 38 = S + 33 S = 5 S = 3 × 11 – 25 S = 8	No, the shoes won't fit	3	M1 S = 3 × 11 – 25 M1 E = 33 + "8" C1 (dep on M1) 41 and 'the shoes will not fit' **Or** M1 38 = S + 33 or S = 38 – 33 or S = 5 M1 S = 3 × 11 – 25 or S = 33 – 25 or S = 8 C1 (dep on M1) 8 and 5 and 'the shoes will not fit'
6 (a) (b) (c)		(65, 100), (80, 110) plotted positive (correlation) 105 – 110	1 1 2	B1 for plotting both points (65, 100), (80, 110) correctly (tolerance one square); ignore any additional plots given. B1 for positive (correlation) or length increases with height oe M1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 76 A1 for given answer in the range 105 – 110

Question	Working	Answer	Mark	Notes
7		6 : 5	4	M1 for $\dfrac{2}{3} \times 165$ oe (= 110) [black counters]
				M1 (dep M1) for $\dfrac{40}{100} \times$ "110" oe (=44)
				M1 (dep M2) for (110 − "44") : 55 or 66 : 55 or a reversed ratio
				A1 cao
				OR
				M1 for 2 : 1; M1 for 2 × "1 − 0.4" or 1.2
				M1 (dep M2) for "1.2" : 1; A1 cao
				OR
				M1 for correct method to find proportion of black counters left in the bag, e.g. $\dfrac{60}{100} \times \dfrac{2}{3}$ ($= \dfrac{120}{300}$)
				M1 for correct method to find proportion of white counters in the bag ie $\dfrac{1}{3}$ oe
				M1 (dep M2) for correct method to find ratio after eg "$\dfrac{120}{300}$" : "$\dfrac{1}{3}$"
				A1 cao

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Question		Working	Answer	Mark	Notes
8			pentagon	2	B1
			hexagon		B1
9	(a)		8		B1 cao
	(b)		tangent drawn		B1 any tangent drawn
10		$(8 \div 20) \times 100$	40	2	M1 for $(8 \div 20) \times 100$ or $\dfrac{40}{100}$ or $\dfrac{8}{20} = \dfrac{8 \times 5}{20 \times 5}$ A1 cao
11	(a)		54	2	M1 for a complete method, e.g. $3 \times 3 \times 6$ A1 cao
	(b)		Both prisms have the same volume (= 18 cm^3)	3	M1 for a method to find the volume of one of the prisms A1 for prism A = 18 and prism B = 18 C1 ft (dep on M1) for a correct comparison of their two stated volumes

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Question		Working	Answer	Mark	Notes
12	(a)	$1 - 0.2 - 0.1$ $0.7 \div 2$	0.35	3	M1 for correctly using total probability 1 or 100% if percentages used M1 (dep) for complete correct method to complete the solution A1 for 0.35 or 35% oe
	(b)	0.1×200	20	2	M1 for 0.1×200 A1 cao
13		$1640 \times \dfrac{30}{100} = 492$ $1640 \div 10 = 164$ $492 + 164 + 550 = 1206$ $1640 - 1206 = 434$ Or $1640 \times \dfrac{40}{100} = 656,$ $656 + 550 = 1206$ $1640 - 1206 = 434$	Yes	5	M1 for attempting to find the area of one section (blue or yellow) M1 for attempting to find the area of the second section (yellow or blue) or award M2 for attempt to find the combined area of blue and yellow) M1 for attempting to find the total area of three sections **or** four sections using white as 400 **or** subtracting the 3 sections from 1640 A1 1206 or 434 or1606 C1 dep on at least M1 for correct conclusion based upon their calculations relating their white area to 400 or"1206" to 1240 or "1606" to 1640

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Question	Working	Answer	Mark	Notes

14		26	3	M1 for $(360 - 90) \div 2 \ (= 135)$
				
				M1 for $4x + 31 = $ "135" or $6x - 21 = $ "135"
				
				A1 cao
				
				OR
				
				M1 for forming an appropriate equation
				
				     eg $4x + 31 = 6x - 21$
				
				     or $6x - 21 + 4x + 31 + 90 = 360$ oe
				
				M1 (dep) for isolating terms in x and number terms
				
				A1 cao

15		11	3	M1 for $52 \times \dfrac{3}{4} \ (=39)$ oe or $\dfrac{120}{360} \times 15 \ (= 50)$ oe M1 for $52 \times \dfrac{3}{4} \ (=39)$ oe and $\dfrac{120}{360} \times 15 \ (= 50)$ oe A1 cao

Question		Working	Answer	Mark	Notes
16		f:b:s = 3:2:1 900 ÷ 6 **OR** $s + 2s + 3s = 900$ $6s = 900$ $s = 900 ÷ 6$ **OR** e.g. 150, 100, 50 (=300) 300, 200, 100 (=600) 450, 300, <u>150</u> (=900)	150	4	M1 for b:s = 2:1 oe or $b = 2s$ or $f = 3s$ or $f = 1.5b$ oe M1 for f:b:s = 3:2:1 or $b = 2s$ and $f = 3s$ oe M1 for 900 ÷ '6' or $s + b + f$ (= 900) A1 cao **OR** M1 for s,2s,3s oe used in algebraic method condone one error M1 for reducing '$s + 2s + 3s$' to the form $as = 900$ M1 for 900 ÷ '6' A1 cao **OR** M1 for trial and improvement method using butter = 2 × sugar or flour = 1.5×butter oe M1 for an attempt to use butter = 2 × sugar and flour = 1.5 × butter, oe for one trial, eg 150, 100, 50 M1 for an attempt to use butter = 2×sugar and flour = 1.5×butter oe for another trial A1 cao

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Question	Working	Answer	Mark	Notes
17	4500×1.04^2	4867.20	3	M1 for 4500×1.04 or for $4500 + 0.04 \times 4500$ or for 4680 or 180 or 360 or 4860 M1 (dep) '4680' $\times$ 1.04 or for '4680' + 0.04 $\times$ '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]

Question	Working	Answer	Mark	Notes
18		95° with reasons	4	M1 for angle *DBC* = 180 – 125 (= 55) **or** angle *EAC* = 180 – 125 (=55) (May be on diagram) A1 for *x* = 95 C2 (dep on M1) with full reasons for their given method, e.g. angles on a straight <u>line</u> add up to <u>180°</u> **and** <u>angles</u> in a <u>triangle</u> add up to <u>180°</u> **and** <u>corresponding</u> angles are equal **or** <u>allied angles</u> / <u>co-interior</u> angles add up to <u>180°</u> **and** <u>angles</u> in a <u>triangle</u> add up to <u>180°</u> (C1 (dep on M1) for one appropriate reason linked to parallel lines) M1 for angle *CDB* = 125 – 30 (= 95)) (May be on diagram) A1 for *x* = 95 C2 (dep on M1) for full reasons, for their given method, e.g. <u>exterior</u> angles are equal to the sum of the <u>interior opposite</u> angles **and** <u>corresponding angles</u> are equal (C1 (dep on M1) for one of these appropriate reasons linked to parallel lines)

Question		Working	Answer	Mark	Notes
19		$25 \div 50 = 0.5h = 30$ min $25 \div 60 = 0.416h = 25$ min	5	3	M1 for $25 \div 50$ **or** $\dfrac{60}{50} \times 25$ **or** 30 (min) **or** 0.5(h) **or** $25 \div 60$ **or** $\dfrac{60}{60} \times 25$ **or** 25 (min) **or** 0.41(6)(h) M1(dep) '0.5' –'0.41(6)' **or** '30' – '25' A1 cao **OR** M1 for $60 \div 25 (= 2.4)$ and $60 \div$ "2.4" **or** $50 \div 25 (= 2)$ and $60 \div$ "2" M1(dep) for '30' – '25' A1 cao
20		$4x - 2y = 26$ $x - 2y = 11$ $3x = 15$ $2x - y = 13$ $2x - 4y = 22$ $3y = -9$	$x = 5$ $y = -3$	3	M1 for correct process to eliminate one variable (condone one arithmetic error) M1 (dep) for substituting found value in one of the equations or appropriate method after starting again (condone one arithmetic error) A1 for $x = 5$ and $y = -3$

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Question	Working	Answer	Mark	Notes
21		$\dfrac{39}{80}$	4	M1 for a correct method to find $\frac{2}{5}$ of 40; eg. $40 \div 5 \times 2 \ (= 16)$ **or** for a correct method to find $\frac{5}{8}$ of 40; eg. $40 \div 8 \times 5 \ (= 25)$ M1 for a correct method to find $\frac{2}{5}$ of 40 **and** $\frac{5}{8}$ of 40 M1 (dep on M1) for $80 - "16" - "25" \ (= 39)$ or $\dfrac{"16" + "25"}{80} \ (= \frac{41}{80})$ A1 $\dfrac{39}{80}$ oe **OR** M1 for $1 - \dfrac{2}{5} \ (= \frac{3}{5})$ **and** $1 - \dfrac{5}{8} \ (= \frac{3}{8})$ M1 for a correct method to find $\frac{3}{5}$ of 40; eg. $40 \div 5 \times 3 \ (= 24)$ **or** for a correct method to find $\frac{3}{8}$ of 40; eg. $40 \div 8 \times 3 \ (= 15)$ M1 (dep on M1) for $"24" + "15" \ (= 39)$ A1 $\dfrac{39}{80}$ oe
22		$w = 2P + 3$	2	M1 for a clear intention to multiply **both** sides by 2 or add $\frac{3}{2}$ to both sides as a first step A1 for $w = 2P + 3$ oe

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Question	Working	Answer	Mark	Notes
23 (a)		n^4	2	M1 for $\dfrac{n^{10}}{n^6}$ oe or $\dfrac{n^7}{n^3}$ oe or $n \times n^3$ oe A1 cao
(b)		$3x^2 + 4x$	2	B2 for $3x^2 + 4x$ or $x(3x + 4)$ (B1 for $x^2 - 2x$ or $2x^2 + 6x$ or $3x^2 + nx$ or $px^2 + 4x$)
(c)		$9ab(2 + 3b)$	2	B2 for $9ab(2 + 3b)$ (B1 for $9a\,(2b + 3b^2)$ or $9b(2a + 3ab)$ or $ab(18 + 27b)$ or $3ab(6 + 9b)$ or $3a(6b + 9b^2)$ or $3b(6a + 9ab)$ or $9ab$ (a two term algebraic expression))

National performance data from Results Plus

Qn	Spec	Paper	Session	Qn	Topic	Max score	ALL	C	D	E	F	G
		Original source of questions					**Mean score of students achieving grade:**					
1	5AM1	1F	1106	Q01b	Money calculations	2	1.34	2.00	1.83	1.25	1.25	1.50
2	5MM2	2F	1411	Q08	Substitution into expressions	4	3.50	3.94	3.74	3.58	3.31	3.00
3	1MA0	2F	1306	Q11	Number sequences	3	2.36	2.86	2.68	2.48	2.20	1.78
4	1MA0	2F	1611	Q12	Ratio	5	Data to be added in January 2017					
5	5AM2	2H	1311	Q13	Derive expressions	3	2.77	2.75	2.44	0.00		
6	1380	2F	0906	Q21	Scatter diagrams	4	2.88	3.65	3.30	2.68	1.88	1.04
7	1MA0	2F	1611	Q26	Ratio	4	Data to be added in January 2017					
8	5MM2	2F	1411	Q10a	Properties of 2D shapes	2	1.31	1.69	1.60	1.28	0.88	0.86
9	5MM1	1F	1311	Q07	Circles	2	1.18	1.65	1.50	1.08	0.83	0.60
10	1380	2F	1011	Q23	Percentages	2	1.11	1.78	1.32	0.72	0.32	0.13
11	5MM2	2F	1506	Q07	Volume	5	2.37	4.04	2.96	1.98	1.55	0.64
12	1MA0	2F	1303	Q26	Probability	5	2.14	4.00	2.38	0.99	0.39	0.23
13	5MM2	2H	1206	Q08	Fractions, percentages, decimals	5	4.11	3.75	2.18	0.94		
14	1MA0	2F	1611	Q27	Angles	3	Data to be added in January 2017					
15	1MA0	2F	1306	Q18	Pie charts	3	0.74	1.99	1.10	0.49	0.16	0.05
16	5AM1	1F	1206	Q25	Ratio	4	1.17	2.16	1.13	0.61	0.09	0.05
17	1380	2H	0906	Q19a	Compound interest	3	1.15	0.60	0.18	0.10		
18	1MA0	1H	1611	Q09	Angles	4	Data to be added in January 2017					
19	1MA0	2F	1211	Q23	Compound measures	3	0.59	1.35	0.70	0.35	0.19	0.12
20	1MA0	1H	1611	Q19	Simultaneous equations	3	Data to be added in January 2017					
21	5MM2	2H	1411	Q07	Fractions	4	1.98	1.18	0.76	0.10		
22	5MM2	2F	1506	Q20	Rearranging equations	2	0.14	0.51	0.15	0.03	0.01	0.00
23	1MA0	2H	1611	Q12acd	Factorising expressions	5	Data to be added in January 2017					
						80						