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)		(65, 100), (80, 110) plotted	1	B1 for plotting both points (65, 100), (80, 110) correctly (tolerance one square); ignore any additional plots given.
	(b)		positive (correlation)	1	B1 for positive (correlation) or length increases with height oe
	(c)		105 – 110	2	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

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Question		**Working**	**Answer**	**Mark**	**Notes**
7			6 : 5	4	M1 for $\frac{2}{3}$ × 165 oe (= 110) [black counters] M1 (dep M1) for $\frac{40}{100}$ × "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. $\frac{60}{100} \times \frac{2}{3}$ $(= \frac{120}{300})$ M1 for correct method to find proportion of white counters in the bag ie $\frac{1}{3}$ oe M1 (dep M2) for correct method to find ratio after eg "$\frac{120}{300}$" : "$\frac{1}{3}$" A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
8			pentagon hexagon	2	B1 B1
9	(a) (b)		8 tangent drawn		B1 cao B1 any tangent drawn
10		$(8 \div 20) \times 100$	40	2	M1 for $(8 \div 20) \times 100$ or $\frac{40}{100}$ or $\frac{8}{20} = \frac{8 \times 5}{20 \times 5}$ A1 cao
11	(a) (b)		54 Both prisms have the same volume (= 18 cm^3)	2 3	M1 for a complete method, e.g. $3 \times 3 \times 6$ A1 cao 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		$1640 \times \frac{30}{100} = 492$ $1640 \div 10 = 164$ $492 + 164 + 550 = 1206$ $1640 - 1206 = 434$ Or $1640 \times \frac{40}{100} = 656,$ $656 + 550 = 1206$ $1640 - 1206 = 434$	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) ÷ 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 $52 \times \frac{3}{4}$ (=39) oe or $\frac{120}{360} \times 15$ (= 50) oe M1 for $52 \times \frac{3}{4}$ (=39) oe and $\frac{120}{360} \times 15$ (= 50) oe A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
16		f:b:s = 3:2:1 900 ÷ 6 **OR** $s + 2s + 3s = 900$ $6s = 900$ $s = 900 \div 6$ **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 M1for 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' × 1.04 or for '4680' + 0.04 × '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]

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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 line add up to 180° **and** angles in a triangle add up to 180° **and** corresponding angles are equal **or** allied angles / co-interior angles add up to 180^o **and** angles in a triangle add up to 180° (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. exterior angles are equal to the sum of the interior opposite angles **and** corresponding angles are equal (C1 (dep on M1) for one of these appropriate reasons linked to parallel lines)

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Question		**Working**	**Answer**	**Mark**	**Notes**
19		25 ÷ 50 = 0.5h = 30 min 25 ÷ 60 = 0.416h = 25 min	5	3	M1 for 25 ÷ 50 **or** $\frac{60}{50}\times 25$ **or** 30 (min) **or** 0.5(h) **or** 25 ÷ 60 **or** $\frac{60}{60}\times 25$ **or** 25 (min) **or** 0.41(6)(h) M1(dep) '0.5' –'0.41(6)'**or** '30' – '25' A1 cao **OR** M1 for 60 ÷ 25 (= 2.4) and 60 ÷ "2.4" **or** 50 ÷ 25 (= 2) and 60 ÷ "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			$\frac{39}{80}$	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 $\frac{"16"+"25"}{80}$ $(=\frac{41}{80})$ A1 $\frac{39}{80}$ oe **OR** M1 for $1-\frac{2}{5}$ $(=\frac{3}{5})$ **and** $1-\frac{5}{8}$ $(=\frac{3}{8})$ 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 $\frac{39}{80}$ 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 $\frac{n^{10}}{n^6}$ oe or $\frac{n^7}{n^3}$ 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

	Original source of questions						Mean score of students achieving grade:					
Qn	Spec	Paper	Session	Qn	Topic	Max score	ALL	C	D	E	F	G
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						