1MA1 Practice papers Set 4: Paper 3F (Regular) mark scheme – Version 1.0					
Question		**Working**	**Answer**	**Mark**	**Notes**
1.	(a)		Hexagon	1	B1 cao
	(b)		8	1	B1 cao
2.	(a)		15 minutes	2	B1 15 B1 (indep) minutes
	(b)		3 05	2	M1 for intention to add 10 minutes and 55 minutes to 2 o'clock A1 3 05 (oe)
	(c)		No with reason	2	M1 for a method to add 75 minutes to '3 05' or to work out the difference between '3 05' and 4 pm or to subtract 75 minutes from 4 pm C1(dep M1) for conclusion based on appropriate working and correct time calculations, ft from (b)

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3.	(a)		126, 21	3	B1 for 126 (seats) M1 for method identified to divide number of people by 6, e.g. "126" ÷ 6 or 84 ÷ 6 (= 14) or 42 ÷ 6 (=7) A1 for 21 (tables)
	(b)		Yes with £483	3	M1 for 84 × 4.5(0) (= 378) or 42 × 2.5(0) (= 105) M1 for 84 × 4.5(0) + 42 × 2.5(0) or "378" + "105" A1 for e.g. yes **and** (£)483 **or** yes **with (**£)17 left
4.	(a)		11	1	B1 cao
	(b)		18	2	M1 for subtracting 13 and multiplying 6 in any order A1 cao
5.	(a)		Newcastle	1	B1 cao
	(b)		3	1	B1 cao
	(c)		–1	2	M1 for intention to find middle of –5 and 3 e.g., may see –5 and 3 identified on a correct number line **or** (–5 + 3) ÷ 2 **or** –5 + (3 – –5) ÷ 2 **or** 3 – (3 – –5) ÷ 2 A1 cao

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6.		Food Mart: 10 pots cost 3.60 Jim's Store: 10 pots cost 3.15 + 35p = £3.50	Jim's store with reason	3	M1 for 180 ÷ 5 oe or 105 ÷ 3 (oe) or 36 or 35 (oe) seen A1 36 and 35 or 0.36 and 0.35 A1 for correct decision based on their values, dependent on M1 scored
7.		5 × 2	10	1	B1 cao
8.		7120 ÷ 8	890	2	M1 for 7120 ÷ 8 or 7120 ÷ 480 A1 cao
9.	(a)		13	1	B1
	(b)		$7e + 4f$	2	B2 (B1 for $7e$ or $4f$)
	(c)		$3(2w + 5)$	1	B1
	(d)	$x^2 + 4x + 7x + 28$		2	M1 for 3 correct terms out of 4 or for 4 correct terms, ignoring signs or for $x^2 + 11x + c$ for any non-zero value of c or for ... + $11x$ + 28
			$x^2 + 11x + 28$		A1

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Question		**Working**	**Answer**	**Mark**	**Notes**
10.	(i)	160 – 90 = 70; 180 – 90 – 70 or 180 – 160	20	3	M1 for 180 – 90 – (160 – 90) or 180 – 90 – 70 or 180 – 160 (oe) A1 cao
	(ii)		Geometric reasoning		B1 for angles in a triangle add up to 180° or alternate angles are equal
11.	(a)	$\frac{9}{15}$	$\frac{3}{5}$	2	M1 for $\frac{9}{15}$ or $\frac{a}{15}$ or $\frac{9}{b}$ A1 cao
	(b)		4	2	M1 for a process to reduce by 2 shaded triangles and 1 unshaded triangle or $2 \times a$ and $1 \times a$ where $a = 2, 3, 4$ or 5 A1 cao
12.	(a)		p^6	1	B1 cao
	(b)		t^5	1	B1 cao
	(c)		6	1	B1 cao
	(d)		4	1	B1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
13.			1.9 km or 1900 m	3	M1 for 1.25 × 1000 (= 1250) **o**r 650 ÷ 1000 (= 0.65) M1 for "1250" + 650 or 1.25 +"0.65" A1 for 1.9 km or 1900 m
14.		<table><tr><td>x</td><td>−2</td><td>−1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>−10</td><td>−6</td><td>−2</td><td>2</td><td>6</td><td>10</td></tr></table>	correct line	3	M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correct) A1 for correct line between -2 and 3
15.	(a)		1,5, 1,6, 1,7, 1,8, 2,5, 2,6, 2,7, 2,8, 3,5, 3,6, 3,7, 3,8, 4,5, 4,6, 4,7, 4,8	2	B2 for all 16 combinations (accept 1,5 etc. and ignore repeats) (B1 for at least 4 correct combinations)
	(b)	P(Jean wins) = $\frac{6}{16}$ $\frac{6}{16} \times 80$	30	3	B1 for P(Jean wins) = $\frac{6}{16}$ oe M1 for '$\frac{6}{16}$' × 80 A1 cao

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Question		**Working**	**Answer**	**Mark**	**Notes**
16.	(a)		$c^8 k^{20}$	1	B1
	(b)	$12x^2 - 3x + 20x - 5$	$12x^2 + 17x - 5$	2	B2 for fully correct (B1 for 3 out of 4 terms correct in working including signs OR 4 terms correct, ignore signs. In a grid the $20x$ need not be signed)
	(c)	$(x - 5)(x + 2) = 0$	5 and -2	3	M1 for $(x \pm 5)(x \pm 2)$ A1 for $(x - 5)(x + 2)$ $(= 0)$ B1 ft (dep on M1) for $x = 5$ and -2
17.			$36.5 \leq H < 37.5$	2	B1 36.5 B1 37.5

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Question		**Working**	**Answer**	**Mark**	**Notes**
18.		425 ÷ 17 = 25 Flour : 8 × 25 = 200g Butter : 4 × 25 = 100g Jam : 5 × 25 = 125g Total weight for 200 rolls: = total grams × 200 ÷ 1000 Flour: 200 × 0.2 = 40 kg Butter : 100 × 0.2 = 20 kg Jam : 125 × 0.2 = 25 kg Total cost = 40 × 40p + 20 × £2.50 + 25 × £1 = £16 + £50 + £25	91	6	M1 for 425 ÷ '8+4+5' or 25 seen M1 for two of 8 × 25 (= 200,) 4 × 25 (= 100), 5 × 25 (= 125) M1 for two of '200' × 200 (= 40 000), '100' × 200 (= 20 000) '125'× 200 (= 25 000) M1 for converting g to kg (at least two ingredients) (= 40, 20, 25) M1 for '40' × 40p + ' 20' × £2.50 + ' 25' × £1 (= £16 + £50 + £25) A1 for 91 or 91.00
19.			80	4	B1 for *EBF* = 50 or *ABE* = 50 M1 for angles given that can lead to *x* = 80 as the next step e.g. *EBF* = 50 and *ABE* = 50 e.g. *EBF* = 50 and *BFG* = 100 e.g. *EBF* = 50 and *BFE* = 80 e.g. *EBF* = 50 and *DEB* = 130 and *ABE* = 50 A1 cao C1 for stating correct reasons appropriate to their method shown

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Question		**Working**	**Answer**	**Mark**	**Notes**
20.	(a)		0.8 on 1st branch 0.3 and 0.05 on 2nd branches	2	B1 0.8 (oe) on 1st branch B1 0.3 and 0.05 (oe) on 2nd branches
	(b)	0.2 × 0.3	0.06	2	M1 0.2 × '0.3' A1 0.06 ft from '0.3' in the tree diagram
21.		use of cos cos ("x") = $\frac{8.3}{9.5}$ (=0.87…) **or** ("x" =) cos $^{-1}$ ($\frac{8.3}{9.5}$)	29.1	3	M1 use of cosine (must be selected for use in trig ratio **NOT** cosine rule) **or** M2 for sin and $\frac{\sqrt{"21.36"}}{9.5}$ following correct Pythagoras **or** M2 for tan and $\frac{\sqrt{"21.36"}}{8.3}$ following correct Pythagoras **or** correct Pythagoras and then correct use of sine or cosine rule with "21.36" A1 for awrt 29.1, e.g. (29.1103…)

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	1MA0	2F	1506	Q02	Properties of 2D shapes	2	1.63	1.87	1.78	1.70	1.59	1.42
2	1MA0	2F	1506	Q08	Time calculations	6	5.31	5.84	5.75	5.61	5.37	4.88
3	1MA0	2F	1406	Q12	Decimals	6	4.99	5.83	5.72	5.54	5.18	4.44
4	5MM2	2F	1311	Q08	Derive expressions	3	2.53	2.88	2.87	2.86	2.10	1.70
5	1MA0	2F	1411	Q07	Directed numbers	4	3.38	3.73	3.60	3.37	3.03	2.54
6	1380	2F	1011	Q14	Ratio	3	2.16	2.77	2.52	2.03	1.21	0.51
7	1380	2F	1006	Q03b	Volume	1	0.77	0.89	0.81	0.76	0.69	0.51
8	1380	2H	1011	Q13	Compound measures	2	1.77	1.76	1.59	1.31		
9	4MA0(R)	1F	1501	Q08	Expand expressions	6	4.52	5.13	4.46	2.50	3.00	4.00
10	5AM2	2F	1206	Q13	Angles	3	1.39	2.12	1.40	0.91	0.50	0.58
11	5MM2	2F	1111	Q10	Ratio	4	2.14	2.70	2.47	1.94	1.48	1.24
12	1MA0	2H	1406	Q10	Index laws	4	2.87	2.69	1.78	0.77		
13	1MA0	2F	1311	Q09	Conversions	3	0.88	1.82	1.04	0.60	0.25	0.11
14	1380	2F	1106	Q19	Graphs of linear equations	3	0.55	1.56	0.63	0.17	0.03	0.01
15	5AM2	2F	1206	Q18	Sample space diagrams	5	1.95	2.43	2.00	1.78	1.26	1.20
16	1380	2H	1106	Q18	Solve quadratic equations	6	2.66	1.11	0.35	0.10		
17	NEW				Error intervals	2	No data available					
18	5AM2	2H	1211	Q12	Ratio	6	3.10	2.40	1.87	0.43		
19	2MB01	2H	1406	Q07	Angles and parallel lines	4	2.25	1.96	1.08	0.52		
20	5AM2	2F	1106	Q20	Probability tree diagrams	4	0.59	1.00	1.22	0.50	0.62	0.17
21	4MA0	1H	1305	Q10	Trigonometry	3	2.71	2.14	1.23	0.41		
						80						