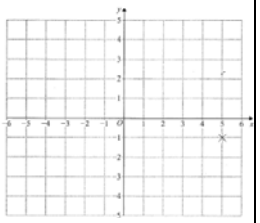
1MA1 Practice papers Set 3: Paper 2F (Regular) mark scheme – Version 1.0					
Question		**Working**	**Answer**	**Mark**	**Notes**
1.		1.85 ÷ 5 × 9 =	3.33	2	M1 for 1.85 ÷ 5 or 1.85 × 9 or 0.37 or 16.65 or 333 seen A1 cao **NB** Working can be in £ or p
2.	(*a*)		37	1	B1 cao
	(*b*)		*a*	1	B1 cao
3.	(*a*) (i)		(1, 2)	2	B1 (allow ($x = 1, y = 2$)
	(ii)		(–4, –3)		B1 (allow ($x = –4$, $y = –3$))
	(*b*)		plot(5, –1) on grid 	1	B1 for plotting at (5, –1)
4.			0.6	3	B1 for 1.8 seen (accept 1800) M1 for "1.8" ÷ 3 A1 for 0.6 oe
5.	(*a*)		Cardiff	1	B1
	(*b*)		− 8	2	M1 for − 3 − 5 or − 3 + − 5 A1

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6.	(*a*)	1.65 + 0.80	2.45	2	M1 for 1.65 + 0.80 or digits 245 seen A1 for 2.45 condone £2.45p
	(*b*)	1.40 + 1.40 + 0.75 + 0.80 = 4.35 4.35 < 5.00 or 5.00 – 4.35 = 0.65 or rounded values used e.g. 1.50 + 1.50 + 1 + 1 = 5 All rounded up so enough money	Yes	3	M1 for 1.40 + 1.40 + 0.75 + 0.80 or 435 digits seen A1 for 4.35 or digits 65 C1 (dep on M1) based on their 4.35 **OR** M1 for addition of appropriately rounded prices A1 for correct total of rounded prices. C1 (dep on M1) Decision given – he has enough money
7.	(*a*)		1.3	1	B1 cao
	(*b*)		400	1	B1 cao
	(*c*)		25	2	M1 for (90 × 1000) ÷ (60 × 60) A1 cao
8.	(*a*)	3 4 4 5 5 6 8 9 10	5	2	M1 for ordering the 9 numbers A1 cao
	(*b*)	(4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4) ÷ 9 54 ÷ 9	6	2	M1 for (4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4) ÷ 9 or 54 ÷ 9 A1 cao
9.		360 ÷ 120 × 40 120, 72, 57, 111	pie chart	3	M1 method to find angle for any sector in pie chart M1 correct angles for sectors **or** two sectors drawn correctly A1 with angles 120, 72, 57, 111 and sectors labelled

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10.		3kg peaches is £1.68 £2.34 – £1.68 = £0.66 £0.66 ÷ 2 = £0.33	£0.33 or 33p	3	M1 2 × £0.84 or digits 168 seen M1(dep) digits 234 – digits "168" or digits 66 seen A1 £0.33 or 33p (units consistent with answer) NB: 0.33 or 33 without units M2, £0.33p, £33p M2A1
11.	(*a*)		12	2	M1 for 9 × 4 ÷ 3 oe A1 cao
	(*b*)		6	3	M1 for a correct first step e.g. 20 × 3 (= 60) or 20 ÷ 10 (= 2) or giving equation e.g. 10*h* ÷ 3 = 20 M1 for complete method to give height e.g. '60' ÷ 10 or '2' × 3 or *h* = 20 × 3 ÷ 10 oe A1 cao
12.		500 × 1.2 (oe) = 600 600 ÷ 12 =	50	4	M2 for 500 × 1.2 (= 600) (oe) (M1 for 500 × 0.2 (= 100) (oe)) M1 for 600 ÷ 12 or 100 ÷ 12 or 1.2 ÷ 12 or 500 ÷ 12 A1 cao SC: B2 for an answer of 8.33 or 8.34

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13.	(*a*)	$72 \div 9$ or 8 or $\frac{5}{9} \times 72$ or 5×72 or 360 or $0.555(5\ldots) \times 72$ oe 8×5 or $360 \div 9$	40	2	M1 A1 cao
	(*b*)	$\frac{5}{15} + \frac{4}{15}$ or $\frac{5+4}{15}$	$\frac{9}{15}$	2	M1 for 2 fractions equivalent to $\frac{1}{3}$ and $\frac{4}{15}$ with a common denominator e.g. $\frac{15}{45} + \frac{12}{45}$ **or** $\frac{15+12}{45}$ A1 dep on M1 for fraction equivalent to $\frac{9}{15}$ (but not $\frac{3}{5}$) produced directly from M1
14.		Angle *ACB* = 67º *x* = 180 – (67 + 67)	46° with reasons	4	B1 for angle *ACB* = 67º, could be marked on the diagram M1 for 180 – ('67' + '67') A1 for *x* = 46° C1 for vertically opposite angles (or vertically opposite angles) **and** base angles of an isosceles triangle are equal **OR** B1 for angle *ACB* = 67º, could be marked on the diagram M1 for 180 – ('67' + '67') A1 for *x* = 46° C1 for "angles on a straight line add up to 180º **and** base angles of an isosceles triangle are equal

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15.			29.1	3	M1 use of cos M1 cos ("*x*") = (= 0.87…) or ("*x*" =) cos – 1 ( ) **OR** or M2 for sin and following correct Pythagoras or M2 for tan and following correct Pythagoras or correct Pythagoras and then correct use of sine or cosine rule with "21.36" A1 for ans rounding to 29.1 (29.1103…)
16.	(*a*)	(I cost per nail) 1.36 ÷ 20 = 0.068, 3.30 ÷ 50 = 0.066, 6.03 ÷ 90 = 0.067 (II e.g. number of nails for £1) 20 ÷ 1.36 = 14.7, 50 ÷ 3.30 = 15.1, 90 ÷ 6.03 = 14.9 (III e.g. cost for 20 nails) 3.30 ÷ 50 × 20 = 1.32, 6.03 ÷ 90 × 20 = 1.34 (IV using multipliers) 50 ÷ 20 = 2.5 and 3.30 ÷ 1.36 = 2.42 90 ÷ 50 = 1.8 and 6.03 ÷ 3.30 = 1.82	Medium + reason	4	M1 for correct method to work out a unit cost for 2 boxes M1 for correct method to work out a unit cost for all 3boxes A1 for (£)0.068 and (£)0.066 and (£)0.067 oe C1 for correct conclusion based on their figures (consistent units) (dep on at least one M1 scored) **OR** M1 for correct method to work out the number of nails for £1oe from 2 boxes M1 for correct method to work out the number of nails for £1oe from all 3 boxes A1 for 14.7 and 15.1 and 14.9 C1 for correct conclusion based on their figures (consistent units) (dep on at least one M1 scored)

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16 cont					**OR** M1 for correct method to work out the cost of 50 nails using the 20 nails cost oe M1 for correct method to work out the cost of 50 nails using the 20 nails cost and 90 nails using the 20 nail cost A1 for (£1.36), (£)1.32, (£)1.34 oe C1 for correct conclusion based on their figures (dep on at least one M1 scored) (consistent units) **OR** M1 for correct method to compare multipliers for cost and number for 1 pair of boxes M1 for correct method to compare multipliers for cost and number for correct 2 pairs of boxes A1 for 2.5 and 2.42, 1.8 and 1.82 C1 for correct conclusion based on their figures (dep on at least one M1 scored) (consistent units)
	(*b*)	2 | 0 5 8 3 | 0 0 0 5 7 9 4 | 0 5 7 9 5 | 0 5	S&L diagram with key	3	M1 for correct stem and unordered leaves (condone two errors or omissions) A1 cao B1 for key, e.g. 2 | 0 means 20mm
	(*c*)		37	1	B1 cao

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17.	(*a*)	$x^2 + 9x - 3x - 27$	$x^2 + 6x - 27$	2	M1 for 3 out of 4 terms correct or 4 terms correct ignoring signs A1
	(*b*)	$v - u = at$	$a = \frac{v-u}{t}$ oe	2	M1 A1
18.			20	3	M1 for establishing the volume of the container is 500 cm^3 M1 for "500" ÷ (5 × 5) A1 cao
19.		$2000 \times 1.05^2 =$ 2000×1.1025 **OR** $2000 \times 1.05 = 2100$ $2100 \times 1.05 = 2205$	£2205	3	M2 2000×1.05^2 (M1 2000×1.05^n, $n \neq 2$) A1 cao **OR** M1 $\frac{5}{100} \times 2000$ (oe) or 100 or 200 or 2100 or 2200 seen M1 (dep) $\frac{5}{100} \times$ (2000 + "100") A1 cao SC B2 for £2315.25 seen (3 yrs)
20.		½ (12 + 8) × 6 = 60 '60' × 20 = 1200 1200 × 5 = 6000 6000 ÷ 1000 = 6	6	5	M1 ½ (12 + 8) × 6 oe or 60 seen M1 (dep) '60' × 20 M1 (indep) '1200' × 5 A1 6000 cao A1 ft (dep on 1st or 3rd M1 scored) for 6

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21.			"**two** angles are **equal** so the triangle is **isosceles**"	5	M1 for $6x - 10 + 4x + 8 + 5x + 2$ or $15x$ M1 for $6x - 10 + 4x + 8 + 5x + 2 = 180$ or $15x = 180$ or ($x =$) $180 \div 15$ A1 $x = 12$ M1 (ft from '12' if M2 scored) for $5 \times$ '12' $+ 2$ or $6 \times$ '12' $- 10$ or $62(^o)$ or $4 \times$ '12' $+ 8$ or $56(^o)$ C1 both base angles as 62 and two angles are equal so the triangle is isosceles NB. $x = 12$ with no working scores M0M0A0 ; correct value of x from clear trial and improvement could gain M1M1A1 **OR** M1 $5x + 2 = 6x - 10$ or $2 + 10 = 6x - 5x$ A1 $x = 12$ M1 $5 \times 12 + 2$ or $6 \times 12 - 10$ or $62(^o)$ or $4 \times 12 + 8$ or $56(^o)$ M1 checking their angles add to 180^o, "62"+"62"+"56" = 180 C1 both base angles as 62 and two angles are equal so the triangle is isosceles **OR** M1 $4x + 8 = 5x + 2$ oe or $4x + 8 = 6x - 10$ A1 $x = 6$ **or** $x = 9$ M1 (dep) for substituting 'x' into one of the angles oe M1 for showing their angles do not sum to 180^o C0

National performance data from Results Plus

Qu No	Spec	Paper	Session	Qu	Topic	Max score	Mean % all	ALL	C	D	E	F	G
1	5MM2	2F	1211	Q19	Ratio	2	81	1.61	1.97	1.86	1.70	1.41	1.07
2	5MM2	2F	1406	Q08	Angles	2	88	1.76	1.95	1.89	1.86	1.69	1.36
3	1380	2F	1011	Q08	Coordinates in 2D	3	87	2.61	2.89	2.78	2.57	2.23	1.78
4	5AM1	1F	1506	Q06	Reading scales	3	79	2.37	2.88	2.76	2.44	1.55	0.80
5	4MA0	2F	1305	Q07	Directed numbers	3	85	2.56	2.87	2.70	2.41	1.89	1.31
6	5AM2	2F	1111	Q08	Money calculations	5	82	4.12	4.66	4.43	4.71	4.10	3.15
7a	4MA0	2F	1401	Q03a	Decimals	1	95	0.95	0.99	0.97	0.94	0.84	0.69
7b	4MA0	2F	1401	Q03d	Decimals	1	50	0.50	0.72	0.44	0.28	0.21	0.15
7c	NEW QUESTION				Decimals	2	No data available						
8	1MA0	2F	1211	Q07	Mean, median, mode	4	68	2.73	3.61	3.28	2.78	2.02	1.18
9	NEW QUESTION				Pie chart	3	No data available						
10	1387	2F	711	Q20	Solve linear equations	3		2.50					
11	5MM2	2F	1406	Q16	Substitution into expressions	5	55	2.73	4.22	3.49	2.61	2.02	0.84
12	5AM1	1F	1106	Q04b	Simple interest	4	35	1.40	3.33	2.83	1.75	0.50	0.17
13	4MA0	2F	1501	Q13	Fractions	4	57	2.27	3.18	2.17	1.27	0.88	0.25
14	5AM1	1F	1211	Q19	Angles	4	41	1.64	3.07	2.17	1.09	0.39	0.33
15	4MA0	1F	1305	Q21	Trigonometry	3	46	1.37	2.21	1.19	0.69	0.45	0.15
16	5AM1	1H	1311	Q04	Ratio	8	69	5.54	5.05	3.88	3.25		
17	NEW QUESTION				Expand double brackets/change subject of formula	4	No data available						
18	5AM2	2F	1506	Q16	Volume	3	25	0.75	1.55	0.78	0.23	0.23	0.19
19	1387	6H	711	Q07	Compound interest	3	77	2.32	1.46				
20	1380	1H	1111	Q16	Compound measures	5	18	0.91	0.36	0.09	0.05		
21	5MM1	1H	1306	Q11	Solve linear equations	5	53	2.65	1.44	0.45	0.00	0.78	0.00
						80							