1MA1 Practice papers Set 3: Paper 3F (Regular) mark scheme – Version 1.0					
Question		**Working**	**Answer**	**Mark**	**Notes**
1.	(i)		9	1	B1
	(ii)		19	1	B1
	(iii)		27	1	B1
2.		$17 - 5 = 12$ $12 \div 2 =$ $2x + 5 = 17$ $2x = 17 - 5$	6	3	M1 $17 \div 2$ (= 8.5) or $17 - 5$ (= 12) M1 for correct order of operations –5 then ÷ 2 A1 cao **Alternative** M1 for forming the equation $2x + 5 = 17$ M1 for attempt to subtract 5 from both sides or divide both sides by 2 as the first step A1 cao **NB** For solutions involving trial and improvement award 3 marks (B3) for the correct answer of 6 but 0 marks for method; embedded solutions get 2 marks as long as the equation or working is complete.
3.	(a)(i)		unlikely	3	B1 cao
	(ii)		evens		B1 cao
	(iii)		impossible		B1 cao
	(b)		A,A,A,A,B,B,C,D	2	M1 for the same number of Cs and Ds OR twice as many As as Bs. A1 cao
4.			Correct line	2	B1 line drawn parallel to *AB* B1 line the same length as *AB*

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5. (a)	$\dfrac{40}{100} \times 20$	8	2	M1 $\dfrac{40}{100} \times 20$ oe A1
(b)	43%, 42.8.%, 43.8%, 43.75%	$\dfrac{3}{7}$ 0.43 $\dfrac{7}{16}$ 43.8%	2	M1 Convert at least 2 of the 3 correctly to percentages or decimals A1 correct order. Accept written in any correct form. SC: Award B1 (1 mark only) if ordered largest to smallest
6. (a)		$2 \times 2 = 4$	1	B1
(b)		No with reason	1	C1 E.g. No - 6 is the lowest number
7. (a)		$20 - t$	1	B1 for $20 - t$
(b)		$4x + 20y$	2	B2 for $4x + 20y$ (B1 for $4x$ or $20y$)

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8.	<table><tr><td></td><td>Bus</td><td>Pre</td><td>Ec</td><td>Total</td></tr><tr><td>M</td><td>(30)</td><td>28</td><td>34</td><td>(92)</td></tr><tr><td>F</td><td>14</td><td>32</td><td>(62)</td><td>108</td></tr><tr><td>Total</td><td>(44)</td><td>(60)</td><td>96</td><td>(200)</td></tr></table> ( ) value given	28	4	M1 for total female passengers 200 – 92 or 108 seen; or for total Economy passengers 200 – 44 – 60 or 96 seen. M1 for male passengers in Economy "96" – 62 or 34 seen; or for female Premium "108" – 62 – (44 – 30) or 32 seen M1 for 92 – 30 – "34" or for 60 – "32" A1 cao **OR** Answers may appear in a two-way table with no other method seen B1 for Female total 108 or Total Economy 96 M1 for "96" – 62 or 34 seen in Male Economy; or "108" – 62 – (44 – 30) or 32 seen in Female Premium M1 for 92 – 30 – "34" or for 60 – "32" A1 cao

Question	Working	Answer	Mark	Notes
9.	$y = \dfrac{1}{2}x + 3$ <table><tr><td>x</td><td>−2</td><td>−1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>2</td><td>2.5</td><td>3</td><td>3.5</td><td>4</td><td>4.5</td><td>5</td></tr></table>	Correct line from (−2, 2) to (4, 5)	3	**(Table of values / calculation of values)** 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 correctly plotted) A1 for correct line between $x = -2$ and $x = 4$ **(No table of values)** M1 for at least 2 correct points with no more than 2 incorrect points plotted M1 for at least 2 correct points (and no incorrect points) plotted **OR** line segment of $y = \dfrac{1}{2}x + 3$ drawn A1 for correct line between $x = -2$ and $x = 4$ **(Use of $y = mx + c$)** M1 for line drawn with gradient of $\dfrac{1}{2}$ **OR** line drawn with a y intercept of 3 M1 for line drawn with gradient of $\dfrac{1}{2}$ **AND** line drawn with a y intercept of 3 A1 for correct line between $x = -2$ and $x = 4$ **SC** : B2 for correct line from $x = 0$ to $x = 4$

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Question		Working	Answer	Mark	Notes
10.	(*a*)		360	2	M1 30 ÷ 10 (= 3) or 120 ÷ 10 (= 12) or 120 + 120 + 120 oe
					A1 cao
	(*b*)		25	2	M1 for $\dfrac{750}{300}$ (= 2.5) oe
					A1 cao
11.			160	3	M1 for 360 ÷ (1 + 3 + 5) (= 40)
					M1 (dep) for 5 × '40' (= 200)
					A1 cao
					OR
					M1 for 360 ÷ (1 + 3 + 5) (= 40)
					M1 (dep) for 5 – 1 (= 4)
					A1 cao

Question		Working	Answer	Mark	Notes
12.	(a)	$5 \times 2 - 3$	7	2	M1 for 5×2 or $5 - 2$ or $5 \times 2 - 3$
					A1 cao
	(b)	$(17 + 3) \div 2$	10	2	M1 for $17 + 3$ or $(17 \pm 3) \div 2$ or $\dfrac{17}{2} \pm 3$
					A1 cao
	(c)	$2 \times m - 3$	$2m - 3$	2	M1 for $2 \times m$ or $m - 3$ or $b \times m - 3$
					A1 for $2m - 3$ oe
					NB If additional variable is introduced as subject then ignore. If $2m - 3 = k$ where k is a number then ignore k
	(d)	$(n + 3) \div 2$	$\dfrac{n+3}{2}$	2	M1 for $n + 3$ or $\dfrac{n \pm 3}{2}$ oe or $n + 3 \div 2$ or $\dfrac{n}{2} \pm 3$ or for a reverse flow chart with at least one correct inverse process identified
					A1 for $\dfrac{n+3}{2}$ oe
					NB If additional variable is introduced as subject then ignore. If $\dfrac{n+3}{2} = k$ where k is a number then ignore k

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13.		$4 + 3 + 3 = 10$ $33 + 42 + 6 = 81$ $81 - 60 = 21$ $10 + 1 = 11$ **OR** $4:33 = 273$ secs $3:42 = 222$ secs $3.06 = 186$ secs $273 + 222 + 186 = 684$ $15:00 - 11:21$ or $900 - 684$	3 minutes 39 seconds	4	M1 for attempting to add minutes or seconds or 684 or 1081 or 1121 seen M1 for a conversion at any stage using 60 (indep) e.g. $4 \times 60 + 33$, or 10 minutes 81 seconds or $81 \div 60$ M1 for attempting to subtract "total time" from 15 minutes 1500 – 1121 or 15.00 – 1081 or 900 – 684 A1 cao.

Question		Working	Answer	Mark	Notes
14.	(*a*)	28 × 0.50 + 32 × 0.72 + 50 × 1.04 + 18 × 1.51 14.00 + 23.04 + 52 + 27.18	£ 116.22	3	M1 at least one *fx* where the *f*s are correct M1 $\sum fx$ where the *f*s are correct A1 cao
	(*b*)	32 × (50 − 40) + 40 × (72 − 59) + 68 × (104 − 85) + 34 × (151 − 123) 320 + 520 + 1292 + 952 = 3084 **OR** 32 × 50 + 40 × 72 + 68 × 104 + 34 × 151 − (32 × 40 + 40 × 59 + 68 × 85 + 34 × 123)	£30.84	4	M1 attempts to find differences in costs M1 $\sum f \times \text{diff}$ A1 cao C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one M1 awarded **OR** M1 $\sum fx$ for first class and second class M1 attempts to find difference between two totals A1 cao C1 Correct conclusion for their working, placed in a sentence and supported by their calculations provided at least one M1 awarded

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Question	**Working**	**Answer**	**Mark**	**Notes**
15. (*a*)		−1, 0, 1, 2, 3	2	B2 for all 5 values and no extras (ignore repeats) (B1 for 4 correct values and no extras or all 5 correct values and one incorrect value)
(*b*)	$x + x + 9 < 60$ $2x < 51$ $x < 25.5$	25	3	M1 for $x + x + 9$ oe A2 cao (A1 for 25.5) **OR** M1 for $60 ÷ 2 (=30)$ and $9 ÷ 2 (=4.5)$ A2 cao (A1 for 25.5) **OR** M1 for $60 – 9 (=51)$ and "51" $÷ 2 (=25.5)$ A2 cao (A1 for 25.5) **OR** M1 for at least 2 trials with correct totals A2 cao (A1 for correct trial of 25 and 26)
16.	1, 4, 7, 10, 13 8, 6, 4, 2, 0	Explanation	2	M1 for listing at least 3 terms of both sequences C1 for Yes and explanation from fully correct working that 4 is in both sequences; numbers in A are increasing; numbers in B are decreasing

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17.		5.32	3	M1 $\sin 43°$ used M1 $7.8\sin 43°$ **OR** M1 for $7.8\cos 43°$ (5.704...) **and** $7.8^2 - "5.704"^2$ (28.298) M1 for $\sqrt{"28.298"}$ **OR** M1 for correct statement of Sine Rule eg $\dfrac{7.8}{\sin 90°} = \dfrac{x}{\sin 43°}$ M1 for correct expression for x e.g. $x = \dfrac{7.8\sin 43°}{\sin 90°}$ A1 for awrt 5.32 (5.319587...)
18.	(*a*) $21 \times 90 = 1890$ $\sqrt{1890}$	43	2	M1 for $\sqrt{21 \times 90}$ or 1890 seen A1 for an answer in the range 43 – 43.5
	(*b*) $50 = \sqrt{21 \times d}$ $2500 = 21d$ $d = 2500 \div 21$	119	3	M1 for $50 = \sqrt{21 \times d}$ oe or 50^2 M1 for $21d = 50^2$ oe A1 for an answer in the range 119 – 119.05

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19.	$^2/_5 = 40\%$ $40\% + 15\% = 55\%$ 27 is 45% or $^9/_{20}$ $27 \div 9 \times 8$	24	5	M1 for 40% or $2 \div 5 \times 100$ oe M1 for "40%" + 15% (= 55%) M1 for equating 100% – "55%" with 27 yellow counters M1 for $27 \div$ "45" $\times 40$ oe A1 cao **OR** M1 for $^{15}/_{100}$ oe M1 for correct attempt to find common denominator to add $^{15}/_{100}$ and $^2/_5$ (= $^{55}/_{100}$) M1 for equating $1 -$ "$^{55}/_{100}$" with 27 yellow counters M1 for $27 \div$ "45" $\times 100$ oe A1 cao **OR** M1 for 0.15 or 0.4 M1 (dep) for '0.15 + '0.4' (= 0.55) M1 for equating $1 -$ '0.55' with 27 yellow counters M1 for $27 \div 0.45$ A1 cao

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20.	$9 + 6 + 9 + 6 = 30$ $30 ÷ 0.5$ **OR** $9 ÷ 0.5 = 18$ $6 ÷ 0.5 = 12$ $18 + 12 + 18 + 12$ **OR** $8 ÷ 0.5 = 16$ $6 ÷ 0.5 = 12$ $16 + 12 + 16 + 12 + 4$ **OR** $9 × 7 − 6 × 8 = 15$ $0.5 × 0.5 = 0.25$ $15 ÷ 0.25$	60	3	M1 $9 + 6 + 9 + 6$ or $8 + 7 + 8 + 7$ (= 30) M1 '30' ÷ 0.5 A1 cao **OR** M1 $9 ÷ 0.5$ (= 18) and $6 ÷ 0.5$ (= 12) M1 '18' + '12' + '18' + '12' A1 cao **OR** M1 $8 ÷ 0.5$ (= 16) and $6 ÷ 0.5$ (= 12) M1 '16' + '12' +'16' + '12' + 4 A1 cao **OR** M1 for $9 × 7 − 6 × 8$ (= 15) M1 for '15' ÷ '0.5^2' A1 cao
21.	One bearing line at 260° (± 2°) or one 9.6 cm line (± 2mm) from A	Intersection of 2 lines in boundary of overlay	2	M1 A1 Condone omission of *D* label Correct position of *D* within tolerance without any lines scores M1A1.

National performance data from Results Plus

Qu No	Spec	Paper	Session	Qu	Topic	Max score	Mean % all	ALL	C	D	E	F	G
1	NEW QUESTION				Prime, square numbers	3	No data available						
2	1380	2F	1203	Q06	Derive expressions	3	92	2.77	2.97	2.93	2.87	2.64	1.87
3	5AM2	2F	1411	Q06	Probability	5	78	3.90	4.19	4.10	3.76	3.46	3.00
4	5MM2	2F	1206	Q08	Parallel lines	2	84	1.68	1.91	1.85	1.73	1.53	1.29
5	4MA0(R)	2F	1405	Q10	Percentages	4	81	3.23	3.72	3.03	3.00	2.50	1.43
6	NEW QUESTION				Properties of numbers	2	No data available						
7	2MB0	1F	1511	Q12	Write an expression	3	38	1.14	1.73	1.19	1.00	0.66	0.00
8	2MB0	1F	1511	Q16	Two-way tables	4	74	2.95	4.00	3.34	1.92	1.17	0.00
9	2MB0	2F	1511	Q21	Straight line graphs	3	49	1.46	2.43	1.46	1.54	0.38	0.00
10	1MA0	2F	1411	Q20	Ratio	4	83	3.31	3.82	3.59	3.25	2.76	2.11
11	5MM2	2F	1406	Q25	Ratio	3	44	1.33	2.50	2.10	1.06	0.48	0.10
12	5MM2	2F	1111	Q11	Substitution into expressions	8	64	5.10	6.48	5.52	4.61	4.02	3.49
13	5AM2	2F	1111	Q05	Time calculations	4	45	1.80	2.86	2.65	1.79	1.41	0.54
14	5AM2	2F	1106	Q15	Money calculations	7	34	2.41	5.00	4.50	2.76	1.50	0.33
15	5MM2	2F	1211	Q24	Solve inequalities	5	33	1.63	2.97	2.30	1.80	0.84	0.22
16	2MB0	2H	1511	Q6	Sequences	2	17	0.34	0.35	0.30	0.00		
17	4MA0	1F	1401	Q15	Trigonometry	3	45	1.34	2.22	1.15	0.42	0.17	0.00
18	5AM2	2H	1306	Q07	Compound measures	5	76	3.78	2.90	1.74	0.44		
19	5MM2	2F	1106	Q17	Fractions, percentages, decimals	5	14	0.71	2.15	0.88	0.52	0.23	0.08
20	5AM1	1F	1406	Q15	Perimeter and area	3	21	0.63	1.28	0.64	0.28	0.15	0.04
21	4MA0	1H	1405	Q06	Bearings	2	62	1.24	0.56	0.28	0.07		
						80							