

IMA1 Practice papers Set 6: Paper 2F (Regular) mark scheme – Version 1.0

Question	Working	Answer	Mark	Notes
1		$\frac{1}{2}$	1	B1 for $\frac{1}{2}$ or an equivalent fraction
2		0.17	1	B1 cao
3		$\frac{4}{5}$	2	M1 for $\frac{40}{50}$ oe, A1 cao
4		18	2	M1 for $24 \div 4 \times 3$ oe A1 cao
5		125	2	M1 for complete method using graph eg 50 euros = £42; 42×3 A1 for 122 – 128
6		36 120° 42	1 1 2	B1 cao for Cazda B1 cao for Zusuki M1 for correct method from using 105° e.g. $18 \div 45 \times 105$, “36” $\div 90 \times 105$ or from table, e.g. Cazda “36” $\times 4 - (18+36+48)$ A1 for 42 or ft values from their table.
7		Jane should buy Greens Garden Shop + costs	4	M1 for Suttons: $140 \div 20 (= 7)$ bags of compost needed M1 for $3 \times 3.25 (= 9.75) + 1 \times 2.25 (=12)$ M1 for Greens: cost of 2 bags eg $\times 4.99 (= 9.98)$, $2 \times 5 (=10)$ C1 for correct conclusion from a comparison of correct appropriate figures

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8	(a)		25	1	B1 cao
	(b)		yes with correct comparative figures	3	<p>M1 for method to calculate journey time travelling at 30 mph, eg $\frac{20}{30}$ (=0.66...) or 40 (mins)</p> <p>M1 (dep) for method to work out arrival time at home, (consistent units), eg 18 10 + “40 mins” (=18 50)</p> <p>C1 for yes with comparison of 40 minutes with 50 minutes or stating arrival time home as 18 50</p> <p>OR</p> <p>M1 for method to calculate speed in order to get home by 1900 eg $20 \div \frac{50}{60}$ (= 24 mph)</p> <p>M1 (dep) for stating speed as 24 mph</p> <p>C1 for yes with supporting calculations showing speed as 24 mph</p>
9	(a)	4×3	12	1	B1 cao
	(b)		5	2	<p>M1 for $4 \times 2 - 3$</p> <p>A1 cao</p>

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Question	Working	Answer	Mark	Notes
10 (a)		37, 41	2	B1 for 37; B1 for 41
(b)		e.g. added 4; +4	1	B1 for sight of $4n + 13$
(c)		61	1	B1 cao
(d)		e.g. even number all numbers in sequence are odd	1	B1 69, 73 are in the sequence or solution of $4n + 13 = 70$ does not give an integer
11	$143.64 \div 19 = 7.56$ $7.56 \times 31 =$	234.36	3	M1 for $143.64 \div 19$ (or 7.56 seen) or 143.64×31 (or 4452.84 seen) M1(dep) for '7.56' $\times 31$ or '4452.84' $\div 19$ or $143.64 + 12 \times '7.56'$ A1 for 234.36 cao accept 234.36p Alternative method: M1 for $\frac{31}{19}$ (or 1.63(1...) seen) M1 (dep) '1.63...' $\times 143.64$ A1 for 234.36 cao accept 234.36p

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Question	Working	Answer	Mark	Notes	
12	(a)	Smart phone 838 DVDs $4 \times 16 =$ 64 Lawnmower $57 \div 3 \times 12$ $= 19 \times 12 =$ 228 $838 + 64 + 228 = 1130$	1130	3	M1 for $57 \div 3 \times 12$ or 228 seen M1 for $838 + 4 \times 16 + '57 \div 3 \times 12'$ A1 cao
	(b)	$4500 \div 500 = 9$ 9×2.40 $= 21.60$ Or $22 \div 2.40 = 9.1666\dots$ $9.1666\dots \times 500$ $= 4583.33\dots$	No with explanation	4	M1 for $4500 \div 500 (= 9)$ (maybe implied by 9 lots of 500 seen) M1 for $'9' \times 2.40$ A1 cao for 21.60 C1 (dep on M1) f.t. for 'No' Decision must be stated and must be attributable from a correct method. for $22 \div 2.40 (= 9.1666)$ Or M1 for $'22 \div 2.40' \times 500$ A1 for answer in range 4583 to 4583.33.... C1 (dep on M1) f.t. for 'No' Decision must be stated and must be attributable from a correct method.

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		<p>Or</p> <p>£2.40 needs 500 points</p> <p>£24 needs 5000 points</p> <p>24 – 2.40 needs 4500 points</p> <p>£21.60 needs 4500 points</p>			<p>Or</p> <p>M1 for £24 (or 2400p) = 5000</p> <p>M1 for 24 – 2.40 (or 2400 – 240) = 4500</p> <p>A1 cao for 21.60</p> <p>C1 (dep on M1) f.t. for ‘No’ Decision must be stated and must be attributable from a correct method.</p>
13	(a)		$50 < a \leq 60$	1	B1 for correctly identifying the modal class interval e.g. 50 – 60 oe
	(b)		Polygon	2	<p>B2 for fully correct frequency polygon - points plotted at the midpoint</p> <p>(B1 for all points plotted accurately but not joined with straight line segments</p> <p>or</p> <p>all points plotted accurately and joined with last joined to first to make a polygon</p> <p>or</p> <p>all points at the correct heights and consistently within or at the ends of the intervals and joined (can include joining last to first to make a polygon)</p>

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Question	Working	Answer	Mark	Notes																				
14	$60 - 29 = 31$ $13 - 8 = 5$ $31 - 10 - 5 = 16$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>Th</td> <td>C</td> <td>It</td> <td></td> </tr> <tr> <td>W</td> <td>6</td> <td>15</td> <td>8</td> <td>29</td> </tr> <tr> <td>M</td> <td>16</td> <td>10</td> <td>5</td> <td>31</td> </tr> <tr> <td></td> <td>22</td> <td>25</td> <td>13</td> <td>60</td> </tr> </table>		Th	C	It		W	6	15	8	29	M	16	10	5	31		22	25	13	60	16	4	<p>M1 for calculation of total Men $60 - 29 (= 31 \text{ Men})$</p> <p>M1 for calculation for Men who like Italian $13 - 8 (= 5 \text{ Men like Italian})$</p> <p>M1 for calculation for Men who liked Thai '$31 - 10 - 5$'</p> <p>A1 for 16</p> <p>OR</p> <p>M1 for a 2-way table or diagram with clear labelling showing at least 3 pieces of the given information correctly placed</p> <p>M1 for correct method for one calculated entry in diagram: Men $60 - 29 (= 31)$ or Women and Chinese $29 - 8 - 6 (= 15)$ or Men and Italian $13 - 8 (= 5)$</p> <p>M1 for 3 correct entries for Men or 2 correct entries for Thai that with correct arithmetic would lead to 16 (Men and Thai)</p> <p>A1 for 16</p>
	Th	C	It																					
W	6	15	8	29																				
M	16	10	5	31																				
	22	25	13	60																				
15	$(7 + 3 + 3) \times (4 + 3 + 3) - 7 \times 4 = 102$ or $2 \times 7 \times 3 + 2 \times 4 \times 3 + 4 \times 3 \times 3 = 102$	11	4	<p>M1 for a correct method to find the area of one appropriate rectangle</p> <p>M1 for a complete method to find the area of the path</p> <p>M1 (dep on M1) for "$102 \div 10$"</p> <p>A1 cao</p>																				

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16	(a)		Evens	1	B1 cao
			Certain	1	B1 cao
	(b)		4	2	M1 for 14 or $\frac{3+7}{n} = \frac{5}{7}$ or any fraction equivalent to $\frac{2}{7}$ or $\frac{5}{7}$ A1 cao
17	(a)		A and C	1	B1 for A and C (no extras)
	(b)		B or E	1	B1 for B or E (or both) (no extras)
	(c)		2	1	B1 cao
18			77	3	M1 for $21 \div 6 (= 3.5)$ for sf length or $21 \div 6 \times 5 (=17.5)$ M1 for $3 \times "3.5" + 3 \times "3.5" + 21 + 21$ or $17.5+17.5+21+21$ oe A1 cao OR M1 for $21 \div 6 (=3.5)$ for sf length M1 for $(6+5+6+5) \times "3.5"$ or 22×3.5 oe A1 cao

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19	$x + x + 4 + 3(x + 4) = 51$ $2x + 4 + 3x + 12 = 51$ $5x + 16 = 51$ $5x = 35$ $5x = 35 \div 5$	Ann 7 Beth 11 Cath 33	5	M1 for $x + 4$ or $3(x + 4)$ oe seen M1 for $x + 'x + 4' + '3(x + 4)'$ M1 $x + 'x + 4' + '3(x + 4)' = 51$ A1 for 7 or 11 or 33 C1 for Ann 7, Beth 11, and Cath 33 oe OR M1 for using a value for n , eg $n + 4$ or $4 \times n$ M1 for attempting a trial using n , $n + 4$ and $3(n + 4)$ M1 for at least 2 trials with correct totals for ' n ' A1 for 11 or 33 C1 for Ann 7, Beth 11, and Cath 33 oe
20		A and 3 B and 2 C and 4 D and 1	2	B2 for all 4 correct (B1 for 2 correct)
21	$1 - (0.008 + 0.015)$	0.977	2	M1 for $1 - (0.008 + 0.015)$ oe A1 for 0.977 oe

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22	(a)		7.5	3	M1 for $4.5^2 + 6^2 (=56.25)$ M1 for $\sqrt{56.25}$ or $\sqrt{(4.5^2 + 6^2)}$ A1 for 7.5
	(b)		217	4	M1 for use of appropriate trig ratio, e.g. $\tan CAB = \frac{4.5}{6} (= 0.75)$, $\sin CAB = \frac{4.5}{\text{"7.5"}} (= 0.6)$, $\cos CAB = \frac{6}{\text{"7.5"}} (= 0.8)$ M1 for inverse trig shown correctly, e.g. $CAB = \tan^{-1} \frac{4.5}{6} (= 0.75)$, $CAB = \sin^{-1} \frac{4.5}{\text{"7.5"}} (= 0.6)$, $CAB = \cos^{-1} \frac{6}{\text{"7.5"}} (= 0.8)$ A1 for 36.8 to 37 (or 53 to 53.2 if identified as <i>ACB</i>) B1ft for bearing $180 + \text{"36.8"}$ if "36.8" is not 40–50, e.g. 216.8 to 217
23		$16 \times 7 = 112$ $112 - 87$	25	2	M1 for $6 \times 14.5 (= 87)$ or $7 \times 16 (=112)$ or $6 \times 1.5 (= 9)$ or $7 \times 1.5 (= 10.5)$ A1 for 25

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24		126	3	M1 for $180 - (360 \div 5) (= 108)$ or $(5 - 2) \times 180 \div 5 (= 108)$ M1 for a complete method eg $\frac{360 - "108"}{2}$ or $180 - \frac{"108"}{2}$ A1 cao

National performance data from Results Plus

Original source of questions						Mean score of students achieving grade:						
Qn	Spec	Paper	Session YYMM	Qn	Topic	Max score	ALL	C	D	E	F	G
1	5MM2	2F	1306	Q09a	Fractions	1	0.80	0.99	0.98	0.96	0.88	0.80
2	5MM2	2F	1306	Q09b	Decimals	1	0.82	0.96	0.95	0.91	0.75	0.70
3	5MM2	2F	1306	Q09c	Fractions	2	1.61	0.73	0.48	0.37	0.33	0.34
4	5MM2	2F	1306	Q09d	Fractions	2	1.38	0.95	0.90	0.86	0.76	0.68
5	1MA0	2F	1611	Q15b	Conversions	2	Data to be added in January 2017					
6	1MA0	2F	1611	Q8	Pie charts	4	Data to be added in January 2017					
7	1MA0	2F	1611	Q10	Ratio	4	Data to be added in January 2017					
8	1MA0	2F	1611	Q21	Compound measures	4	Data to be added in January 2017					
9	1MA0	2F	1306	Q08	Substitute into expressions	3	1.78	2.88	2.59	1.96	1.08	0.46
10	4MA0(R)	1F	1501	Q05	Sequences	5	4.53	4.76	4.61	4.66	4.00	1.00
11	1380	2H	906	Q05	Decimals	3	2.88	2.83	2.59	2.00		
12	5AM2	2F	1211	Q20	Ratio	7	5.26	6.45	5.97	5.27	3.52	1.53
13	1MA0	1F	1611	Q22	Grouped frequency	3	Data to be added in January 2017					
14	5AM1	1H	1306	Q13	Two-way tables	4	3.66	3.56	2.96	1.62		
15	1MA0	1F	1611	Q23	Area	4	Data to be added in January 2017					
16	1MA0	2F	1311	Q16	Probability	4	2.37	3.23	2.63	2.15	1.80	1.51
17	1MA0	2F	1211	Q13	Congruence and similarity	3	1.73	2.37	1.96	1.65	1.35	0.98
18	5AM2	2H	1411	Q05	Scale factors	3	2.28	2.11	1.21	1.00		
19	5AM1	1H	1211	Q09	Solve linear equations	5	3.87	3.48	2.73			
20	1380	2H	1011	Q11	Distance-time / travel graphs	2	0.89	0.77	0.66	0.57		
21	5AM2	2H	1111	Q06	Probability	2	1.47	1.62	1.00	0.00	0.00	0.00
22	1MA0	2H	1406	Q15	Pythagoras in 2D	7	2.91	2.16	0.88	0.20		
23	1380	2H	1203	Q02	Mean, median, mode	2	0.71	0.45	0.14	0.07		
24	1MA0	2H	1611	Q14	Angles	3	Data to be added in January 2017					
					TOTAL	80						