

IMA1 Practice papers Set 5: Paper 2F (Regular) mark scheme – Version 1.0

Question		Working	Answer	Mark	Notes
1.	(a)		35 000	1	B1 cao
	(b)		430	1	B1 cao
2.	(a)		2 hours 20 minutes	2	M1 for a full method to find the difference between the two times or 2.2 hours A1 2 hours and 20 minutes or 140 minutes
	(b)		No with supporting calculations	3	M1 for adding 18 and 24 to 20 50 A1 21 32 C1 (dep M1) correct conclusion from the comparison of their figure with 21 30 Or M1 for subtracting 18 and 24 from 21 30 A1 20 48 C1 (dep M1) correct conclusion from the comparison of their figure with 20 50 Or M1 for finding the time differences A1 for 40 minutes and 42 minutes C1 (dep M1) correct conclusion from the comparison of their time durations

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Question	Working	Answer	Mark	Notes
3.		3	3	M1 for $4200 \div 25 (= 168)$ M1 for “168” $\div 60 (= 2.8)$ or “160” $- 60 - 60 (= 40)$ A1 cao OR M1 for $25 \times 60 (=1500)$ M1 for $4200 \div “1500” (= 2.8)$ or $4200 - “1500” - “1500” (= 1200)$ A1 cao
4.		40	3	M1 for $24 \div 3 (= 8)$ M1 for “8” $\times 5$ A1 cao OR M1 for $3 \times 24 (= 72)$ M1 for “ 3×24 ” $- 8 - 8 - 8 - 8$ A1 cao

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Question		Working	Answer	Mark	Notes
5.	(a)		$\begin{array}{cccc c} 24 & 12 & \times & \times & \times \\ \times & \times & 6 & 11 & 46 \\ \hline \times & 21 & \times & 19 & \times \end{array}$	3	B3 cao (B2 for 4, 5 or 6 entries correct) (B1 for 2 or 3 entries correct)
	(b)		20	1	B1 cao
	(c)		84	1	B1 cao
6.	(a)(i)		2.5 marked with arrow		B1 for 2.5 marked with arrow
	(a)		2500		B1 cao
	(ii)				
	(b)	$2.5 \times 40 = 100,$ $100 \div 60 = 1\text{h } 40\text{min}$ $1(\text{pm}) - 1\text{h } 40\text{min}$	11.20 (a.m.)		M1 for a correct method to find the total cooking time M1 for a correct method to find the start time A1 cao

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7.	(a)	Graph (0, 0) to (100, 2400)	conversion graph	2	M1 for straight line through (0, 0) or through one other correct point e.g. (10, 240) or (50, 1200) or through (100, 2400) A1 cao
	(b)	Line from 1800 lira to graph and down	73 – 77	2	M1for line drawn from 1800 lira to their graph A1 ft for '75' ± £2

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8.	$\frac{130}{100} \times 340 = 442$ <p align="center">OR</p> $\frac{30}{100} \times 340 = 102$ $340 + 102 = 442$ <p align="center">OR</p> $\frac{30}{100} \times 340 = 102$ $450 - 102 = 348$	<p align="center">£442</p> <p align="center">or</p> <p align="center">32.35%</p> <p align="center">or</p> <p align="center">348</p>	<p align="center">3</p>	<p>M1 for $\frac{100 + 30}{100}$ oe</p> <p>M1 for $\frac{130}{100} \times 340$ oe (= 442)</p> <p>A1 442</p> <p>OR</p> <p>M1 $\frac{30}{100} \times 340$ (= 102) oe</p> <p>M1(dep) $340 + 102$ (= 442)</p> <p>A1 442</p> <p>OR</p> <p>M1 $\frac{30}{100} \times 340$ (= 102) oe</p> <p>M1 (dep) $450 - 102$ (= 348) or $450 - 340$ (= 110)</p> <p>A1 348 or 102 and 110</p>

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9.	(i)		6	3	B1 cao
	(ii)		5		B1 cao
	(iii)		9		B1 cao
10.	(a)		2	1	B1 cao
	(b)		4	2	M1 for showing a clear intention to add all ten numbers and to divide by 10 A1 cao
	(c)		55	2	M1 for evidence of at least 4 attempts to multiply number of birds by frequency e.g. 0×3 , 2×1 , 3×2 , 4×3 , 5×4 , 3×5 A1 cao
11.	(a)		23	1	B1
	(b)	$(-5 - 3) \div 4$	-2	2	M1 A1
	(c)		$y = 4x + 3$	2	B2 for $y = 4x + 3$ oe If not B2 then B1 for $4x + 3$ or $x = (y - 3) \div 4$

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Question		Working	Answer	Mark	Notes
12.	(a)		12	1	B1 cao
	(b)		16	2	M1 for $96 \div 2 (= 48)$ or $96 \div 3 (= 32)$ or $96 \div 6$ oe A1 cao
13.		$60 - 18 = 42, 42 \div 2 = 21$ OR $x + x + 18 = 60, 2x = 42$	21	2	M1 for $(60 - 18) \div 2$ A1 cao Or M1 for $x + x + 18 = 60$ oe A1 cao Or M1 for 3 trials differing by 18 eg (20, 38), (10, 28), (22, 40) A1 cao

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14.		4.20	4	<p>M1 for $30 \div (2 + 1) (=10)$</p> <p>M1 for “10” $\times 2 \times 2.8 (=56)$ oe</p> <p>M1 for $(98 - “56”) \div “10”$</p> <p>A1 cao 4.2(0)</p> <p>OR algebraic approach</p> <p>M1 for (eg) $c=2a$ and $c+a=30$</p> <p>M1 for (eg) $2.8 c+wa=98$</p> <p>M1 for ($w =$) $(98 - “56”) \div “10”$</p> <p>A1 cao 4.2(0)</p>
15.		2.15 p.m.	3	<p>M1 for $240 \div 60 (=4)$</p> <p>M1 for adding at least 3 of the 4 periods of time eg 20 (mins) + “4 (hrs)” + 25 (mins) + 30 (mins) (= 5 h 15 min) oe or 2.15 without units</p> <p>A1 for 2.15 pm 14 15 (h or p.m.) oe</p>

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16.	<p>8 cans of cola</p> <p>12 burgers</p> <p>10 buns</p> <p>LCM is 120</p> <p>Cola $5 \times 2 \times \text{£}3.95 = \text{£}39.50$</p> <p>Burgers $10 \times \text{£}4.95 = \text{£}49.50$</p> <p>Buns $12 \times \text{£}1.95 = \text{£}23.40$</p>	£112.40	6	<p>M1 for attempt to find LCM of 8, 12 and 10, eg by listing multiples or 120 seen</p> <p>M1 for (cola =) $120 \div 8 (= 15)$ packs or (burgers =) $120 \div 12 (= 10)$ packs or (buns =) $120 \div 10 (= 12)$ packs</p> <p>M1 for (packs of cola =) $\frac{2}{3} \times 15 (= 10)$</p> <p>M2 for (total cost =) $\frac{2}{3} \times 15 \times 3.95 + 10 \times 4.95 + 12 \times 1.95$</p> <p>(M1 for total cost for their packs of cola, burgers and buns)</p> <p>C1 (dep on first M1) for £112.4(0) or ft their costs with work for cola, burgers and buns clearly identified</p>
17.	$4.5 \times 1000 \times 1000$	4 500 000	2	<p>M1 for complete method equivalent to $4.5 \times 1000 \times 1000$</p> <p>A1 for 4500000 oe</p>
18.		195	2	<p>M1 for $325 \div (8 - 3) (= 65)$</p> <p>A1 cao</p>

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19.			The Friendly Bank	4	<p>M1 for a correct method to find interest for the first year for either bank OR correct method to find the value of investment after one year for either bank OR use of the multiplier 1.04 or 1.05</p> <p>M1 for a correct full method to find the value of the investment (or the value of the total interest) at the end of 2 years in either bank</p> <p>A1 for 2100.8(0) and 2110.5(0) (accept 100.8(0) and 110.5(0))</p> <p>C1 (dep on M1) ft for a correct comparison of <i>their</i> total amounts, identifying the bank from their calculations</p> <p>OR</p> <p>M1 for either 1.04×1.01 or 1.05×1.005</p> <p>M1 for 1.04×1.01 and 1.05×1.005</p> <p>A1 for 1.0504 and 1.05525</p> <p>C1 (dep on M1) ft for a correct comparison of <i>their</i> total multiplying factors identifying the bank from their calculations</p>

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20.	$30x + 4y = 46 \quad (\times 2)$ $24x + 8y = 45.20 \quad (\times 0.5)$ Eg $60x + 8y = 92$ $24x + 8y = 45.20$ $36x = 46.8$ $x = \frac{46.8}{36}$ Eg $30x + 4y = 46$ $12x + 4y = 22.60$ $18x = 23.4$ $x = \frac{23.4}{18}$ OR Eliminates x first Or substitution back into any correct equation	Petrol £1.30 Oil £1.75	5	B1 for correct equations expressed in terms of two variables (oe) M1 for correct process to eliminate either variable (condone one arithmetic error) A1 for either $x = £1.30$ or $£1.75$ oe M1 (dep on 1 st M1) for correct substitution of their found variable OR M1 (indep of 1 st M1 for a correct process to eliminate the other variable (condone one arithmetic error) A1 cao for both $x = £1.30$ and $£1.75$ oe (SC B1 for $x = £1.30$, B1 for $y = £1.75$ oe if M0 scored)

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21.	$(100\% - 10\%) \times \text{Normal Price} = \text{£}4.86$ Normal Price $= \text{£}4.86 \div 0.9$	£5.40	3	M1 for '4.86 is 90%' or $(100\% - 10\%) \times \text{Normal Price} = 4.86$ or $4.86 \div 90$ M1 for $4.86 \div 0.9$ or $4.86 \times 10 \div 9$ oe A1 £5.40 (accept 5.4) OR M1 $10\% = \text{£}0.54$ or $\text{£}4.86 \div 9$ M1 (dep) $\text{£}4.86 + \text{'£}0.54\text{'}$ A1 £5.40 (accept 5.4)
22.	$180 - 150 (=30)$ $360 \div \text{'30'}$ OR $\frac{N-2}{N} \times 180 = 150$ $(N-2)180 = 150N$ $30N = 360$	12	3	M1 for $180 - 150 (=30)$ M1 for $360 \div \text{'30'}$ A1 cao OR M1 for $\frac{N-2}{N} \times 180 = 150$ M1 for $360 \div \text{'30'}$ A1 cao

National performance data from Results Plus

Qn	Original source of questions				Max score	Mean score of students achieving grade:						
	Spec	Paper	Session YYMM	Qn		Topic	ALL	C	D	E	F	G
1	5AM1	1F	1306	Q01	Rounding to dp or sf	2	1.76	1.91	1.83	1.71	1.50	1.56
2	1MA0	2F	1511	Q02	Time calculations	5	4.34	4.73	4.52	4.23	3.70	3.03
3	5MB3	3F	1511	Q05	Number problems	3	2.48	2.67	2.64	2.57	1.00	1.33
4	5MB2	2F	1511	Q14	Perimeter	3	2.12	2.71	2.24	2.00	1.12	0.33
5	1380	2F	1011	Q20	Two-way tables	5	4.26	4.82	4.67	4.32	3.45	2.11
6	5AM1	1F	1311	Q07	Conversions	5	3.76	4.56	3.77	3.43	2.60	2.00
7	5AM2	2F	1211	Q12	Conversion graphs	4	2.38	3.44	2.51	2.01	1.41	0.90
8	5AM1	1F	1406	Q18	Percentages	3	1.49	2.51	1.93	0.90	0.27	0.08
9	1380	2F	1111	Q14	Properties of 2D shapes	3	1.99	2.49	2.20	1.90	1.57	1.22
10	1MA0	2F	1311	Q14	Mean, median, mode	5	2.84	4.02	3.34	2.64	1.86	1.15
11	4MA0(R)	2F	1405	Q05	Derive expressions	5	3.32	3.98	3.77	2.14	2.08	0.29
12	5MM2	2F	1411	Q05	Volume	3	1.40	2.37	1.76	1.23	0.62	0.86
13	5AM2	2F	1211	Q07	Derive expressions	2	0.89	1.55	1.01	0.52	0.22	0.11
14	5AM2	2F	1411	Q19	Fractions, percentages, decimals	4	2.32	3.10	2.71	2.12	0.47	1.50
15	1MA0	2H	1406	Q06	Time calculations	3	2.12	2.01	1.43	0.83		
16	5AM1	1H	1211	Q07	Money calculations	6	4.36	3.72	2.07			
17	5MB3	3H	1303	09b	Conversions	2	0.26	0.03	0.02	0.05		
18	NEW				Ratio	2						
19	1MA0	2H	1306	Q14	Compound interest	4	2.22	1.94	0.97	0.23		
20	5AM1	1H	1206	Q15	Simultaneous equations	5	3.05	1.43	0.36	0.00		
21	1380	2H	1106	Q16	Reverse percentages	3	1.41	0.65	0.21	0.05		
22	5MM2	2H	1106	Q08	Interior and exterior angles	3	1.08	0.41	0.09	0.00		
						80						