International GCSE in Mathematics A - Paper 1F mark scheme

Question		Working	Answer	Mark	AO		Notes
1	**a**		15 or 31	4	AO1	B1	for 15 or 31 or both
	b		24 or 36		AO1	B1	for 24 or 36 or both
	c		36 or 64		AO1	B1	for 36 or 64 or both
	d		2 or 31		AO1	B1	for 2 or 31 or both
2	**a**	$\frac{64}{100}$			AO1	M1	any fraction equivalent to $\frac{64}{100}$
			$\frac{16}{25}$	2		A1	
	b		0.09	1	AO1	B1	
	c		14	1	AO1	B1	
3	**a**		Thursday	1	AO3	B1	
	b	24 ÷ 3 × 5			AO3	M1	for 24 ÷ 3 (=8)
			40	2		A1	
	c	2 : 3.25 oe **or** 2×'8' : 3.25 ×'8'			AO1	M1	any correct ratio ft from '8' in (b)
			8:13	2		A1	accept 1 : $\frac{13}{8}$ oe
4	**a**		22, 26	1	AO1	B1	
	b		add 4	1	AO1	B1	
	c		42	1	AO1	B1	
	d		reason	1	AO1	B1	e.g. no numbers in sequence are odd numbers; $4n - 2 = 95$ gives $n = 24.25$ which is not an integer;

Question		Working	Answer	Mark	AO		Notes
5	**a**		2	1	AO2	B1	
	b		20	1	AO2	B1	
	c		16	1	AO2	B1	
	d		correct reflection	2	AO2	B2	B1 for reflection in a different vertical line
6		25 ÷ 3.95 (=6.32…)			AO1	M1	accept repeated addition or repeated subtraction from 25
		25 – '6' × 3.95				M1	
			1.3(0)	3		A1	
7	**a**				AO1	M1	for $3c$ or $9m$
			$3c + 9m$	2		A1	for $3c + 9m$ or $3(c + 3m)$
	b	$5x = 4 + 9$			AO1	M1	
			2.6 oe	2		A1	
8	**a**		195	1	AO1	B1	cao
	b	249 ÷ 3		2	AO1	M1	
			83			A1	cao
	c		$d = 3w$	2	AO1	B2	B1 for d = linear expression in w B1 for $3w$ oe SC: B1 for $w = \frac{d}{3}$ oe

Question	Working	Answer	Mark	AO		Notes
9	180 – 132 (=48) 180 – 2×'48'			AO2	M1 M1	
					A1	
		84	5		B2	Angles in a triangle sum to 180°, base angles of an isosceles triangle are equal, angles on a straight line sum to 180° (B1 for any correct reason)
10	0.8 × 0.3 = 0.24 **or** 108 ÷ 1000 (=0.108)			AO2	M1	
	'0.108' ÷ '0.24'				M1	dep
		0.45	3		A1	
11 **a**		13.488(56…)	2	AO1	B2	B1 for 144.76 **or** 10.73…
b		13.5	1	AO1	B1	ft from (a) from 4 or more sig figs

Question	Working	Answer	Mark	AO		Notes
12	x −2 −1 0 1 2 3 y −10 −7 −4 −1 2 5	$y = 3x - 4$ drawn from $x = -2$ to $x = 3$	4	AO1	B4	For a correct line between $x = -2$ and $x = 3$
					B3	For a correct straight line segment through at least 3 of (−2, −10) (−1, −7) (0, −4) (1, −1) (2, 2) (3, 5) **OR** for all of (−2, −10) (−1, −7) (0, −4) (1, −1) (2, 2) (3, 5) plotted but not joined
					B2	For at least 2 correct points plotted **OR** for a line drawn with a positive gradient through (0, −4) and clear intention to use of a gradient of 3 (eg. a line through (0, -4) and (0.5, −1)
					B1	For at least 2 correct points stated (may be in a table) **OR** for a line drawn with a positive gradient through (0, −4) **but not** a line joining (0, −4) and (3, 0) **OR** a line with gradient 3

Question		Working	Answer	Mark	AO	Notes		
13	**a**	1 – (0.15 + 0.4 + 0.35) **or** 1 – 0.9			AO3	M1		
			0.1 oe	2		A1		
	b	0.35 × 40			AO3	M1		
			14	2		A1		
14	**a**		$10g + 35$	1	AO1	B1		
	b		−2, −1, 0, 1, 2	2	AO1	B2	B1 for −3, −2, −1, 0, 1, 2 **or** −2, −1, 0, 1	
15		149 × 0.76 (=113…) **or** 113.24			AO1	M1		M1 for 149 × 0.76 × 1.54 (=174…)
		164.78 ÷ 1.54 (=107)				M1		M1 for "174…" – 164.78 (=9.6096)
		"113.24" − "107"				M1	dep on at least **one** previous M mark ; accept "107" – "113.24"	M1 for "9.6096" ÷ 1.54
			6.24	4		A1		
16		7800 ÷ 9.75 or 7800 ÷ 585 x 60			AO2	M2	M1 for 7800 ÷ 9.45 or 7800 ÷ 585 or 13.3....	
			800	3		A1		

Question	Working	Answer	Mark	AO		Notes
17	28÷ (6 − 4) (=14)			AO1	M1	or use of cancelled ratios (eg 3 : 6 : 4 = 0.75 : 1.5 : 1)
	"14" × 3 (=42)				M1 (dep)	28÷0.5(=56) or cancelled ratios, (e.g. 56 × 0.75) or M2 for $28 \div \frac{2}{3}$ oe
		42	3		A1	
18 **a**		$25 < d \leq 30$	1	AO3	B1	B1 identifies 25 → 30 class
b	(12 × 2.5) + (6 × 7.5) + (4 × 12.5) + (6 × 17.5) + (14 × 22.5) + (18 × 27.5) **or** 30 + 45 + 50 + 105 + 315 + 495 **or** 1040			AO3	M2	M1 for frequency × consistent value within interval NB. Products do not need to be added Condone one error
	'1040' ÷ 60				M1	
		$17\frac{1}{3}$	4		A1	accept 17.3(33…)
c				AO3	M1	for $\frac{a}{60}$ with $a < 60$ **or** $\frac{32}{b}$ with $b > 32$
		$\frac{32}{60}$ oe	2		A1	

Question	Working	Answer	Mark	AO		Notes
19	**Working with all 12 boxes** 12×15 (=180) **or** 12×12 (=144) $12 \times 12 \times \frac{3}{4} \times 1.6$ oe (=172.8) $12 \times 15 \times 1.15$ oe (=207) **or** 180×0.15 oe (=27) $\frac{'207' - '172.8'}{36}$ **or** $\frac{34.2}{36}$ **or** $\frac{'27' + ('180' - '172.8')}{36}$	0.95	5	AO1	M1 M1 M1 M1 A1 cao	for correct total cost or correct total number of melons (either may appear as part of another calculation) for revenue from all full price melons sold for total revenue or total profit dep on M3
	Alternative – working with one box $15 \div 12$ (=1.25) **or** $12 \times \frac{3}{4}$ (=9) $12 \times \frac{3}{4} \times 1.6$ oe (=14.4) 15×1.15 (=17.25) $\frac{"17.25" - "14.4"}{3}$ **or** $\frac{2.85}{3}$	0.95	5		M1 M1 M1 M1 A1 cao	for price of 1 melon **or** number of full price melons for revenue from all full price melons sold for total revenue from one box dep on M3

Question	Working	Answer	Mark	AO		Notes
20	Circular arc, centre B, to intersect both lines AB and BC Equal length arcs, from intersections on each line, meeting to give a point on the bisector	correct bisector	2	AO2	M1 A1	dep on M1. Full construction shown.
21 **a**		$9e^2f(2e + 5f^3)$	2	AO1	M1 A1	Any correct partially factorised expression
b	$(x \pm 6)(x \pm 2)$ $(x - 6)(x + 2)$	6, −2	3	AO1	M1 M1 A1	or correct substitution into quadratic formula (condone one sign error) or $\frac{4 \pm \sqrt{64}}{2}$ dep. on at least M1
22	$\cos 35 = \frac{PR}{17.6}$ $17.6 \times \cos 35$	14.4	3	AO2	M1 M1 A1	14.4 ~ 14.42
23	22.50 ÷ 15 (=1.5) **or** 100 ÷ 15 (=6.6….) '1.5' × 100 (=150) **or** '6.6…' × 22.5(0)	150	3	AO1	M1 M1 A1	dep } M2 for 22.5 ÷ 0.15

Question		Working	Answer	Mark	AO	Notes	
24	**a**		140 000	1	AO1	B1	
	b		Mars	1	AO1	B1	
	c	$1.2 \times 10^5 - 5 \times 10^4$ **or** 120000 – 50000 **or** 70000 oe			AO1	M1	
			7×10^4	2		A1	
25		$\sqrt{9.5^2 - 7.6^2}$ **or** $\sqrt{90.25 - 57.76}$ **or** $\sqrt{32.49}$ **or** $\sqrt{32.5}$			AO2	M1	
		$(BC =)$ 5.7				A1	
		$\frac{1}{2} \times 7.6 \times$'5.7' **or** 21.6(6) **or** 21.7				M1	dep on first M1
							or eg. $ACB = \sin^{-1}\left(\frac{7.6}{9.5}\right)(=53.1...)$ **and** $\frac{1}{2} \times 9.5 \times$'5.7'$\times \sin$'53.1'
		$\frac{1}{2} \times \pi \times \left(\frac{\text{'5.7'}}{2}\right)^2$ **or** 12.7(587...) **or** 12.8				M1	dep on first M1
			34.4	5		A1	for answer rounding to 34.4 ($\pi \rightarrow$ 34.4187... 3.14→34.4123...)