IGCSE (9–1) Maths - practice paper 3F mark scheme

Results Plus data on 94 of the 100 marks:

Paper 3							Edexcel averages:									
Year	Paper	Qu. no	New qu. no.	Mean score	Max score	Mean %	ALL	A*	A	B	C	D	E	F	G	U
1706	1FR	Q01	Q01	3.24	5	64.8	3.24				4.34	3.35	2.69	2.27	1.53	0.61
1706	1FR	Q02	Q02	4.96	6	82.7	4.96				5.79	5.42	4.99	3.97	2.78	1.15
1706	1FR	Q03	Q03	1.99	3	66.3	1.99				2.64	2.00	1.70	1.48	0.96	0.31
1706	1FR	Q05	Q04	1.86	3	62.0	1.86				2.52	1.99	1.74	1.25	0.38	0.08
1706	1FR	Q06	Q05	2.11	3	70.3	2.11				2.50	2.26	2.02	1.74	1.22	0.39
1706	1FR	Q08	Q06	2.90	4	72.5	2.90				3.41	3.16	2.78	2.68	1.15	0.61
1706	1FR	Q09	Q07	2.40	4	60.0	2.40				3.38	2.65	2.13	1.22	0.54	0.08
1706	1FR	Q10	Q08	2.92	6	48.7	2.92				5.08	3.06	1.51	0.61	0.39	0.08
1706	1FR	Q13	Q09	3.59	4	89.8	3.59				3.90	3.74	3.80	3.26	2.79	0.69
1706	1FR	Q14	Q10	1.78	3	59.3	1.78				2.67	2.08	1.30	0.68	0.32	0.15
1706	1FR	Q15	Q11	1.70	4	42.5	1.70				2.90	1.59	1.04	0.60	0.21	0.23
1706	1FR	Q17	Q12	1.37	3	45.7	1.37				2.33	1.52	0.74	0.31	0.09	0.00
1706	1FR	Q19	Q13	4.24	8	53.0	4.24				6.56	4.30	2.98	2.03	1.11	0.08
1706	1FR	Q20	Q14	1.61	4	40.3	1.61				2.93	1.46	0.87	0.36	0.17	0.00
1706	1FR	Q21	Q15	1.62	6	27.0	1.62				3.46	1.00	0.61	0.14	0.17	0.08
1706	1FR	Q22	Q16	1.45	3	48.3	1.45				2.24	1.47	1.23	0.51	0.23	0.23
Sp ppr	1F	Q16	Q17		3											
1701	2FR	Q21	Q18	1.98	3	66.0	1.98				2.76	1.29	1.11	0.50	0.50	0.00
1606	1FR	Q24	Q19	0.53	2	26.5	0.53				0.85	0.38	0.46	0.19	0.29	0.00
1706	3HR	Q08	Q20ab	2.09	3	69.7	2.09	2.78	2.45	1.97	1.38	0.67	0.21			0.16
1506	3HR	Q05c	Q20c	1.44	2	72.0	1.44	1.84	1.48	1.20	0.82	0.30	0.06			0.00
1706	3HR	Q9	Q21	2.98	4	74.5	2.98	3.81	3.46	2.87	2.09	1.21	0.52			0.29
1701	3HR	Q13	Q22	2.54	3	84.7	2.54	2.89	2.59	2.47	2.15	1.73	0.84			0.44
1706	2FR	Q23a	Q23	0.94	2	47.0	0.94				1.53	0.92	0.62	0.06	0.00	0.00
Sp ppr	2F	Q21	Q24		3											
1706	1FR	Q25	Q25	2.58	6	43.0	2.58				4.16	2.84	1.64	0.71	0.51	0.23
				54.82	**94**	**58.3**	**54.82**				**72.39**	**50.39**	**37.59**	**24.57**	**15.34**	**5.89**

Ques	Working	Answer	Mark	Notes
1a		8.8	1	B1
b		Correct place	1	B1
c		6	1	B1
d	(1.4 + 4.8) ÷ 2 or (4.8 - 1.4) ÷ 2 (=1.7) and '1.7' + 1.4	3.1	2	M1 for a method to find the half way value
				A1
				Total 5 marks

2a		10	1	B1
b		30	1	B1
c		40	1	B1
d		0.6(0)	1	B1
e	$\frac{60}{100}$	$\frac{3}{5}$	2	M1 oe
				A1
				Total 6 marks

3a		× at 0.5	1	B1
b		× at $\frac{1}{6}$	1	B1
c		× at 0	1	B1
				Total 3 marks

4a		Obtuse	1	B1
b		60	1	B1
c		Trapezium	1	B1
				Total 3 marks

5a		9	1	B1	
b		21	1	B1	
c		Explanation	1	B1	e.g all the terms are odd and 150 is even **or** 149 is in the sequence **or** $4n + 1 = 150$ does not have an integer answer
					Total 3 marks

6a		(−3, −2)	1	B1	
b		Plotted	1	B1	
c		Suitable point	2	B2	for e.g (3, −2), (−3, 4) (B1 for *C* plotted correctly but coordinates written incorrectly)
					Total 4 marks

7a		24	1	B1	
bi		$\frac{1}{10}$	3	B1	
ii	28, 32, 36, 38, 40, 45, **or** $\frac{6}{n}$	$\frac{6}{10}$		M1	ft from (a)
				A1	ft from (a)
					Total 4 marks

8a	$3x + 3x + 2x + x + x$	36	3	M1
	$10x = 360$ oe			M1
				A1
b	5400 ÷ 360 (= 15) **or** $\frac{40}{360}$ **or** 360 ÷ 40 (=9)	600	3	M1
	'15 ' × 40 **or** $\frac{40}{360} \times 5400$ **or** 5400 ÷ "9"			M1
				A1
				Total 6 marks

9	34.00 + 9.20 + 12.20 + 39.00 + 8.75 + 9.50 (= 112.65)	7.35	4	M1 adding at least 5 correct prices
	70 + 50 (= 120)			M1
	'120' −'112.65'			M1 (dep M1,M1)
				A1
				Total 4 marks

10a		3	1	B1
b	$8 \times 2t = 80$	5		M1 or for 8 × 2*t* **or** 80 ÷ 8 **or** 80 ÷ 2
				A1
				Total 3 marks

11a		17 or 19	1	B1 for either or both
b		2, 23	1	B1
c	(60 − 2) ÷ 2	29, 31	2	M1 any complete method
				A1
				Total 4 marks

12	$5x - x = 8 - 10$			M1	for correct rearrangement with x terms on one side and numbers on the other in a correct equation **or** the correct simplification of either x terms or numbers on one side in a correct equation eg. $4x - 8 = -10$; $5x = x - 2$
	$4x = -2$			M1	or $-4x = 2$ **or** $4x + 2 = 0$ **or** $-4x - 2 = 0$ NB: This mark implies the previous M1
		-0.5	3	A1	oe e.g. $-\frac{2}{4}$ dep on M1
					Total 3 marks

13a	3500 ÷ 119			M1			
		29.41	2	A1	for 29.41 – 29.412		
b	8500 ÷ 52 **or** 163(.461..)			M1		M1 for 8500 × 119 =1011500	M1 for 119 ÷ 52 (=2.28…)
	"163.461.".× 119			M1	dep	M1 for "1011500" ÷ 52	M1 for 8500 × "2.28…"
		19452	3	A1	for 19380 – 19520		
c	24 ÷ 60 (=0.4) **or** 2.4 **or** $2\frac{24}{60}$oe **or** 2 × 60 + 24 (=144)			M1			
	1534 ÷ 2.4 oe **or** (1534 ÷ 144) × 60 oe			M1	(allow 1534 ÷ 2.24 **or** answer of 684(.82…) or 685)		
		639	3	A1	for 639 – 639.17		
							Total 8 marks

14a	$\pi \times 2.5$ oe **or** $2 \times \pi \times \left(\frac{2.5}{2}\right)$			M1	
		7.85	2	A1	7.85 – 7.86
b	$10 \times \frac{4.7}{2.5}$ oe **or** $10 \times \frac{470}{250}$ oe			M1	or for digits 188
		18.8	2	A1	accept 19 if 18.8 seen
					Total 4 marks

15a	$\frac{a+b+c}{3} = 21$ **or** $\frac{a+b}{2} = 19$ **or** $3 \times 21 (=63)$ **or** $2 \times 19 (=38)$			M1	
	$3 \times 21 - 2 \times 19$			M1	for a complete method
		25	3	A1	
b	$2 \times 19 - 20$ (=18) **or** $21 \times 3 - 20 -$ "25" (=18)			M1	ft from (a) for a complete method to find age of 3rd person
	"25" – "18"			M1	dep or for 18 – 25
		7	3	A1	ft from answer in (a)
					Total 6 marks

16	e.g. $2 \times 2 \times 7 \times 12$ **or** at least 3 divisions in a factor tree			M1	for the start of a correct method e.g. may be a factor tree **or** consecutive divisions condone 1 error
	All 6 correct prime factors, no extras (2,2,2,2,3,7,(1))			M1	e.g. from a factor tree, ignore 1s
		$2 \times 2 \times 2 \times 2 \times 3 \times 7$	3	A1	oe dep on M1, M1
					Total 3 marks

17	$120 \div 100^2$ (=0.012) or $810 \div 120$ (=6.75)			M1
	$810 \div$ "0.012" or "6.75" $\times 100^2$			M1
		67 500	3	A1
				Total 3 marks

18	$12.8^2 - 9.7^2$ or $163.84 - 94.09$ or 69.75		3	M1	For squaring and subtracting $[a = \cos^{-1}\left(\frac{9.7}{12.8}\right)(= 40.7...)$ **and** $\sin 40.7.. = \frac{x}{12.8}$ *or* $\tan 40.7.. = \frac{x}{9.7}]$
	$\sqrt{12.8^2 - 9.7^2}$			M1dep	For square root $[x = 12.8\sin 40.7..$ *or* $x = 9.7\tan 40.7..]$
		8.35		A1	Allow 8.35 - 8.352
					Total 3 marks

Q	Working	Answer	Mark	Notes
19	$\frac{360}{8}$ or $180 - \frac{(8-2)\times 180}{8}$	45	2	M1 For complete correct method for exterior angle A1 Do not isw interior angle found
				Total 2 marks

20a		Correct triangle (−1, −2) (−1, 0) (2, −2)		2	B2 (B1 for a rotation of 90° clockwise about a different centre i.e. a triangle in the same orientation as the correct triangle **or** rotation by 90° anticlockwise about (0, 2))
b		Correct trapezium (1, −1) (1, −2) (3, 1) (3, −2)		1	B1
c		Vertices at (3, 2) (3, 4) (4, 4) (4, 3)	2		B2 If not B2 then B1 for shape of correct size and orientation **OR** a correct enlargement scale factor $-\frac{1}{2}$, centre (1, 3)
					Total 5 marks

21a		$10e^5f^2$	2	B2	If not B2 then award B1 for $ke^5f^2, k \neq 10$ or $10e^5f^a$ or $10e^bf^2$ $a, b \neq 0$
b		$(x - 6)(x + 1)$	2	B2	If not B2 then award B1 for $(x - 1)(x + 6)$ **or** $(x - 3)(x - 2)$ **or** $(x + 3)(x - 2)$ **or** $(x - 3)(x + 2)$
					Total 4 marks

22	a		0.00079	1	B1	cao
	b		2.015×10^{10}	2	M1	for 20.15×10^9 **or** 20 150 000 000 or 2.015×10^n where $n \neq 10$
					A1	For 2×10^{10} or better
						Total 3 marks

23	$4x \geq 27 - 13$ or $4x \geq 14$ or $-4x \leq 13 - 27$ or $-4x \leq -14$	$x \geq 3.5$	2	M1 A1	Accept an equation in place of an inequality or Accept wrong inequality sign or Accept 3.5 oe given as answer oe Must be the final answer
					Total 2 marks

24	Eg $14x = -7$, $14y = 77$, $6x + 4(3 - 5x) = 19$	$x = -0.5$, $y = 5.5$	3	M1 M1 A1	For correctly eliminating 1 variable One value correct dep on M1 Both values dep on M1
					Total 3 marks

25a	$100 - 9.4$ (= 90.6)	$\frac{9.4}{100} \times 607$ oe (= 57.058)			M1	
	$\frac{"90.6"}{100} \times 607$ oe	607 – "57.058"			M1	(dep)
			550	3	A1	for 549.942 **or** 549.94 **or** 549.9
b	$\frac{100}{20} \times 1320$ oe				M2	for a complete method If not M2 then award M1 for a correct first step $1320 \div 20$ (=66) **or** $0.2x = 1320$ **or** $1320 \div 2$ (=660)
			6600	3	A1	
						Total 6 marks