

GCSE Mathematics (9-1) Practice Tests Set 8 – Paper 2F mark scheme

Question	Working	Answer	Marks		Notes
1		$\frac{63}{100}$	1	B1	
2		46800	1	B1	
3		73.7	1	B1	
4		9	1	B1	
5		7^5	1	B1	
6	$64=8^2$ or $64=4^3$ or $\sqrt{64}=8$ or $\sqrt[3]{64}=4$ or $8 \times 8 = 64$ or $4 \times 4 \times 4 = 64$ or 1, 4, 9, 16, 25, 36, 49, 64 or 1, 8, 27, 64		2	M1	
		$64=8^2$ and $64=4^3$		A1	or $\sqrt{64}=8$ and $\sqrt[3]{64}=4$ or correct list of square & cube numbers to 64
7		1331	1	B1	
8		9.9	1	B1	
9	$3.80 \div 4 (=0.95)$ or 0.75×3.80 oe (=2.85)	2.24		M1	
	$7.33 - 3 \times "0.95" (=4.48)$ or $7.33 - "2.85" (=4.48)$			M1	
	"4.48" $\div 2$			M1	
10	400 and 1300 or 900		3	M1	read scales correctly or $1300 \times 0.4 (=520)$ or $400 \times 0.4 (=160)$ or $9 \times 0.4 (=3.6)$ or $(x - y) \times 0.4$ where x and y are readings and $x = 1300$ or $y = 400$
	$(1300-400) \times 0.4$ or "520" – "160"			M1	Difference of both correct readings $\times 0.4$ oe
		360		A1	cao

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11	(a)	$4.3333(3\dots) + 0.37894(7\dots)$ or $\frac{13}{3} + \frac{36}{95}$		2	M1	Evaluate either fraction correctly as a decimal to at least 5SF(rounded or truncated) or as a simplified fraction or an answer of 4.71(2)
			4.7122(80702)		A1	Correct to at least 5SF (rounded or truncated).
	(b)		4.71	1	B1	ft if at least 4SF given in (a) (not 4.71̇)
12	(a)		correct pattern	1	B1	5 dots × 5 dots open square
	(b)		16, 20	1	B1	
	(c)	eg 4×13 or $14 + 14 + 12 + 12$ or $12 \times 4 + 4$ or 24, 28, 32, 36, 40, 44, 48, 52 or a fully correct diagram		2	M1	allow 1 arithmetical error in continuing the sequence to 13 terms
			52		A1	
	(d)		$4n$	1	B1	oe eg $n + n + n + n$ or $4 + (n - 1)4$
	(e)	$90 \div 4 (= 22.5)$ or 88		2	M1	or continuing the sequence to 88 or 92 with just one error
			22		A1	

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13	a		$0 < p \leq 1$	1	B1	
	b	$0.5 \times 19 + 1.5 \times 12 + 2.5 \times 5 + 3.5 \times 2 + 4.5 \times 2$ (=56) or $9.5 + 18 + 12.5 + 7 + 9$ (=56)	1.4	4	M2	for at least 4 correct products added (need not be evaluated) If not M2 then award M1 for consistent use of value within interval (including end points) for at least 4 products which must be added OR correct mid-points used for at least 4 products and not added
		“56” \div 40			M1	dep on at least M1 Allow division by their $\sum f$ provided addition or total under column seen
					A1	for 1.4 or $1\frac{2}{5}$
14		(angle EAD or ADE or AED \Rightarrow) 60 (angle BCD \Rightarrow) $180 - 108$ (=72)	123	5	B1 M1	may be seen on diagram may be seen on diagram

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	(angle BAD =) $360 - (135 + "72" + 90) (=63)$ or (angle BAD =) $360 - 297 (=63)$ or (angle EAB =) 123			M1 may be seen on diagram
				B1 (dep on M1) for at least one correct reason reason 1 : <u>Angles on straight line</u> add up to 180° or Angles on straight <u>line</u> add up to <u>180°</u> reason 2 : <u>Angles in a quadrilateral</u> (accept 4-sided shape) add up to 360° or Angles in a <u>quadrilateral</u> (accept 4-sided shape) add up to <u>360°</u>
				A1 for 123 and full reasons
15 (a)	$\frac{36+33}{135}$		2	M1 for numerator of $36 + 33 (= 69)$ or denominator of 135
		$\frac{69}{135}$		A1 Accept $0.51(11\dots)$ or $51.(11\dots)\%$ 2 sf or better
(b)	$\frac{27}{135} \times 360$ or $360 \div 5$ or $27 \times \frac{8}{3}$ oe		2	M1 allow use of $\frac{8}{3} = 2.666\dots$ to 1 dp truncated or rounded
		72		A1 cao
16 (a)	$25 - 4 \times -3$ or $25 - -12$ or $25 + 12$		2	M1 Correct substitution
		37		A1
(b)	$2x^2 + x$		3	M1
	$(+)3x - 6$			M1 indep
		$2x^2 + 4x + 1$		A1 Cao

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17	$32 \div 5 (= 6.4 \text{ or } 6) \text{ or } 15 \div 5 (=3)$ or $30 \div 5 (=6)$ $"6" \times "3" \times "6" (=108)$	No with 108	3	M1 M1 integer values must be used A1 SC: If no marks awarded then award B1 for an answer of 'yes' with 115(.2) OR 'yes' and 14400 and 13750
18	$\frac{3450}{2+6+7} (=230) \text{ or } \frac{2}{2+6+7} \times 3450 (= 460)$ or $\frac{7}{2+6+7} \times 3450 (=1610) \text{ or } \frac{7-2}{2+6+7} \left(=\frac{1}{3} \right)$		3	M1
	$(7-2) \times "230" \text{ or } 7 \times "230" - 2 \times "230" \text{ or}$ $"1610" - "460" \text{ or } "\frac{1}{3}" \times 3450$			M1 dep
		1150		A1
19	$\frac{8}{100} \times 20000 (=1600)$		4	M1
	$20000 + \frac{8}{100} \times 20000 (=21600) \text{ or}$ $(20\ 000 - 19200) + \frac{8}{100} \times 20000 (=2400)$			M1 Award M2 for 20000×1.08or 21600
	$\frac{"21600"-19200}{19200} (\times 100) \text{ or } \frac{"2400"}{19200} (\times 100)$ or $"21600" \div 19200 (\times 100) \text{ oe}$			M1 or for 1.125 or $\frac{9}{8}$ or 112.5%
		12.5		A1 oe

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20	$170 \div 2 (=85)$ or $170 \div 2 \times 7 (=595)$ or $7 \div 2 (=3.5)$ $7 \times "85" + 170 (=765)$ or $9 \times "85" (=765)$ or $"595" + 170 (=765)$ or $170 \times "3.5" + 170 (=765)$ $"765" \div 3 (=255)$ or $"765" \div 3 \times 5 (=1275)$ $"255" \times 2$ or $"1275" - "765"$ or $"1275" \div 5 \times 2$	510	5	M1 M1 award of this mark implies the first M1 M1 dep on M2 M1 A1
21 (a)	$2 \times \pi \times 0.56 \times 1.6$		2	M1 Award even if part of a calculation including 1 or 2 circles
		5.63		A1 awrt 5.63
(b)	$\frac{0.6}{1.6} (=0.375)$ or $\frac{1.6}{0.6} (= \frac{8}{3} = 2.\dot{6})$ or $\frac{r}{0.56} = \frac{0.6}{1.6}$ or $(r =) \frac{0.56 \times 0.6}{1.6}$ or $0.56 \div 2.\dot{6}$ oe		2	M1 Correct scale factor (given as a fraction or a ratio) or correct equation in r or a correct expression for r . Allow 2.6666... to 1 dp rounded or truncated
		0.21		A1 Allow 21 cm oe if units shown
22	$9.7^2 + 3.5^2 (=106.34)$ $\sqrt{9.7^2 + 3.5^2}$ or $\sqrt{"106.34"}$ (=10.3...) $\pi \times "10.3..."$ or $2 \times \pi \times \frac{"10.3..."}{2}$	32.4	4	M1 M1 for the use of MN and a correct angle (70.1... or 70.2, 19.8...) in a correct trig statement eg $\cos 70.2 = \frac{3.5}{MN}$ M1 M1 for a complete method to find MN eg $MN = \frac{3.5}{\cos 70.2} (=10.3...)$ M1 dep on M2

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				A1	for answer in range 32.3 – 32.41
23	$\cos 52 = \frac{12.6}{x}$ or $\sin 38 = \frac{12.6}{x}$		3	M1	Or use of tan to find horizontal side $12.6 \times \tan 52$ or $\frac{12.6}{\tan 38}$ (=16.12...) and a correct first stage to find x eg $x^2 = 12.6^2 + "16.12..."^2$ or $\sin 52 = \frac{"16.12..."}{x}$ oe Allow correct first stage of sine rule
	$(x =) \frac{12.6}{\cos 52}$ or $\frac{12.6}{\sin 38}$ (= $\frac{12.6}{0.61566...}$) or			M1	Accept decimal correct to at least 3SF Or $(x =) \sqrt{12.6^2 + "16.12..."^2}$ or $(x =) \frac{"16.12..."}{\sin 52}$ Allow rearranged $(x =)$ sine rule
		20.5		A1	20.4 – 20.5
24	eg $7x + 7y = 105$ – $5x + 5y = 75$ + $7x - 5y = 3$ $7x - 5y = 3$ $7(15 - y) - 5y = 3$ or $7x - 5(15 - x) = 3$ oe		3	M1	Correct method to eliminate x or y : coefficients of x or y the same and correct operation to eliminate selected variable (condone any one arithmetic error in multiplication) or writing x or y in terms of the other variable and correctly substituting
	$6.5 + y = 15$ or $x + 8.5 = 15$ or $7 \times 6.5 - 5y = 3$ or $7x - 5 \times 8.5 = 3$			M1	dep Correct method to find second variable using their value from a correct method to find first variable or for repeating above method to find second variable

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		$x = 6.5,$ $y = 8.5$		A1 dep on first M1
25 (a)	$\frac{2000-800}{300} (= 4)$ or $\frac{2000-800}{150} (= 8)$ or -8 seen correctly in working		3	M1 Accept $300 + 300 + 300 + 300$ or $800, 1100, 1400, 1700, 2000$ oe
	$6 - "4" \times 2$			M1
		-2		A1
(b)	$\frac{12}{5} (= 2.4 \text{ hr})$ or $\frac{12}{5} \times 60 (= 144 \text{ min or } 2 \text{ hr } 24 \text{ mins})$		3	M1
	$\frac{800}{10} (= 80 \text{ min})$ or $\frac{800}{10} \div 60 (= 1.\dot{3} \text{ or } 1 \text{ hr } 20 \text{ min})$			M1 indep
		3 hr 44 min		A1

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Question	Skills tested	Mean score	Max score	Mean %	Edexcel averages:	Mean score of students achieving grade				
					ALL	5	4	3	2	1
Q01	Numbers and the number system	0.88	1	88	0.88	0.98	0.97	0.95	0.86	0.58
Q02	Numbers and the number system	0.86	1	86	0.86	0.95	0.93	0.91	0.80	0.69
Q03	Decimals	0.68	1	68	0.68	0.95	0.88	0.76	0.49	0.18
Q04	Percentages	0.88	1	88	0.88	0.99	0.96	0.92	0.85	0.67
Q05	Powers and roots	0.80	1	80	0.80	0.98	0.93	0.85	0.74	0.43
Q06	Powers and roots	1.29	2	65	1.29	1.86	1.71	1.34	0.89	0.42
Q07	Powers and roots	0.91	1	91	0.91	0.99	0.98	0.97	0.92	0.65
Q08	Powers and roots	0.92	1	92	0.92	1.00	0.99	0.98	0.90	0.71
Q09	Applying number	2.74	4	69	2.74	3.79	3.46	3.02	2.10	1.12
Q10	Measures	2.12	3	71	2.12	2.81	2.49	2.23	1.80	1.09
Q11a	Electronic calculators	1.44	2	72	1.44	1.86	1.76	1.52	1.19	0.68
Q11b	Degree of accuracy	0.50	1	50	0.50	0.82	0.69	0.51	0.31	0.12
Q12a	Sequences	0.82	1	82	0.82	0.92	0.88	0.84	0.78	0.64
Q12b	Sequences	0.95	1	95	0.95	0.97	0.98	0.97	0.93	0.90
Q12c	Sequences	1.79	2	90	1.79	1.92	1.90	1.85	1.78	1.51
Q12d	Sequences	0.37	1	37	0.37	0.72	0.52	0.33	0.19	0.08
Q12e	Powers and roots	1.00	2	50	1.00	1.49	1.23	1.07	0.75	0.33
Q13a	Statistical measures	0.52	1	52	0.52	0.91	0.75	0.51	0.25	0.10
Q13b	Statistical measures	1.48	4	37	1.48	3.23	2.37	1.29	0.45	0.05
Q14	Angles, lines and triangles	2.09	5	42	2.09	3.71	3.00	2.19	1.04	0.26
Q15a	Probability	1.39	2	70	1.39	1.85	1.74	1.52	1.09	0.46
Q15b	Statistical measures	0.77	2	39	0.77	1.66	1.17	0.67	0.23	0.03
Q16a	Expressions and formulae	1.20	2	60	1.20	1.75	1.58	1.30	0.86	0.24
Q16b	Algebraic manipulation	1.28	3	43	1.28	2.40	1.82	1.22	0.63	0.18
Q17	3D shapes and volume	0.84	3	28	0.84	1.07	1.09	1.00	0.63	0.26
Q18	Ratio and proportion	1.75	3	58	1.75	2.86	2.55	1.82	0.91	0.21
Q19	Percentages	2.09	4	52	2.09	3.46	2.93	2.33	1.02	0.15
Q20	Ratio and proportion	1.85	5	37	1.85	3.41	2.65	1.87	0.89	0.31
Q21a	3D shapes and volume	1.05	2	53	1.05	1.68	1.54	1.13	0.51	0.09

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Q21b	Similarity	0.36	2	18	0.36	1.12	0.56	0.18	0.04	0.00
Q22	Pythagoras' Theorem	1.04	4	26	1.04	2.93	1.67	0.71	0.13	0.04
Q23	Trigonometry	0.58	3	19	0.58	1.73	0.93	0.30	0.08	0.01
Q24	Simultaneous linear equations	0.54	3	18	0.54	1.86	0.81	0.21	0.08	0.01
Q25a	Applying number	1.49	3	50	1.49	2.16	1.77	1.60	1.15	0.61
Q25b	Measures	1.13	3	38	1.13	1.97	1.54	1.15	0.63	0.18
		40.40	80	51	40.40	63.76	52.73	41.02	26.90	13.99

Suggested Grade Boundaries based on performance of students in Summer 2018

5	4	3	2	1
58	47	34	20	13