

IGCSE June 05

MATHEMATICS 4400, MARK SCHEME

Paper 3H

Q	Working	Answer	Mark	Notes	
1.	$\frac{5.8}{3.12}$	1.8589...	2	M1	For 5.8 or 3.12 seen
				A1	For first 5 figures
Total 2 marks					
2.	$10x + 15 = 30$ or $2x + 3 = 6$ $10x = 30 - 15$ or $2x = 6 - 3$	$1\frac{1}{2}$	3	M1	For $10x + 15$ or $2x + 3 = 6$
				M1	For isolating x term in $ax + b = c$
A1	For $1\frac{1}{2}$ oe inc $\frac{3}{2}$				
Total 3 marks					
3.	$\frac{15}{18} - \frac{8}{18}$	$\frac{7}{18}$	2	M1	For clear attempt to express with common denominator - at least one correct
				A1	cao
Total 2 marks					
4.		correct enlargement	3	B3	B2: for translation of correct shape or 2 vertices correct B1: for one side correct length or for enlargement scale factor 2, centre (2,1)
Total 3 marks					

5.	(a)	$0.45 + 0.12$	0.57	2	M1 A1	For $0.45 + 0.12$ or $1 - (0.45 + 0.12)$ or $1 - 0.45 - 0.12$ or 0.43 For 0.57 oe as final answer
	(b)	250×0.12 or 250×0.1	30	2	M1 A1	For 250×0.12 or 250×0.1 cao
						Total 4 marks

6.	(a)		$3(3p + 5)$	1	B1	cao
	(b)		$q(q - 4)$	1	B1	cao
	(c)		$(x + 2)(x - 5)$	2	B2	(B1 for one correct factor or signs reversed)
						Total 4 marks

7.	(a)	$\left(\frac{9+5}{2}\right) \times 6$	42	2	M1 A1	cao
	(b)	"42" \times 15	630	2	M1 A1	ft from (a)
						Total 4 marks

8.	(a)	eg $\frac{15}{100} \times 240$ or 36 240 - "36"	204	3	M1 M1 A1	Or M2 for $\frac{100-15}{100} \times 240$ dep on first M1 cao
	(b)	0.85 oe seen $\frac{663}{0.85}$	780	3	B1 M1 A1	For $\frac{663}{0.85}$ or $\frac{663}{1-0.15}$ cao
						Total 6 marks
9.	(a)	$2x < 8$	$x < 4$	2	M1 A1	For $x < 4$ as final answer
	(b)		1, 2, 3	2	B2	(B1 for two correct and none wrong or three correct and one wrong)
						Total 4 marks
10.	(a)	$15 \times 8 + 25 \times 38 + 35 \times 28 + 45 \times 4$ $+ 55 \times 2$ $= 120 + 950 + 980 + 180 + 110$ $= 2340$ $2340 \div 80$	29.25	4	M1 M1 M1 A1	For products $m \times f$ where m is consistent inc end points (dep)for use of midpoints (15,25... or 15.5,25.5,...) (dep on 1 st M1) for adding and $\div 80$ Accept 29, 29.2, 29.3 if first two M1s scored (If 15.5,25.5... used, mean = $\frac{2380}{80} = 29.75$)

	(b)		8, 46, 74, 78, 80	1	B1	cao
	(c)		Points correct Curve or line segments	2	B1 B1	$\pm\frac{1}{2}$ sq ft from sensible table ft from points if 4 or 5 points correct or if points are plotted consistently within each interval at the correct heights
	(d)	use of 40 (or 40.5) on graph or 40 th (or 40.5 th) stated	-29	2	M1 A1	For use of 40 (or 40.5) on graph or 40 th (or 40.5 th) stated If M1 scored, ft from cumulative frequency graph If no working, follow through only from correct curve
						Total 9 marks

11.	$h^2 = \frac{W}{l}$		lh^2	2	M1 A1	
						Total 2 marks

12.	(a)	30 : 1200 or 1200 : 30 oe	1 : 40	3	M2 A1	For 30 : 1200 or 1200 : 30 oe [M1 for 12(00...) : 30(00...) or 30(00...) : 12(00...) oe] Accept 1 : 0.025, 1 : $\frac{1}{40}$ oe, $n = 40$ ft if M1 scored SC B2 for 1 : 2.5, 1 : 4, 1 : 0.4, 1 : 400, 1 : 25, 1 : 250
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	(b)	$95 \times "40" \text{ or } 3800$ $"3800" \div 100$	38	3	M1 M1 A1	ft from their n
	OR	$\frac{95}{30}$ $\times 12$	38	3	M1 M1 A1	(dep)
						Total 6 marks

13.	(a)	$\frac{360}{18}$	20	2	M1 A1	cao
	(b)	$"20" \times (180 - 18)$ or $("20" - 2) \times 180$	3240	2	M1 A1	ft from (a)
						Total 4 marks

14.	$2(x-1) + 2x + 3 = 4$ or $\frac{2(x-1) + 2x + 3}{4} = 1$ or $\frac{2(x-1)}{4} + \frac{2x+3}{4} = 1$ $2x - 2 + 2x + 3 = 4$ or $\frac{2x-2+2x+3}{4} = 1$ or $\frac{2x-2}{4} + \frac{2x+3}{4} = 1$ $4x = 3$	$\frac{3}{4}$	4	M1 Clear attempt to multiply both sides by 4 (or multiple) or expressing LHS with a denominator of 4 or a multiple of 4 M1 (dep) expanding brackets or M2 for $\frac{x}{2} - \frac{1}{2} + \frac{2x}{4} + \frac{3}{4} = 1$ (M1 if one error) M1 (dep on first M1) reducing to form $ax = b$ using a correct method or $\frac{x}{2} + \frac{2x}{4} = 1 + \frac{1}{2} - \frac{3}{4}$	A1 oe	Total 4 marks
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15.	(a)	$\frac{10}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$	$2\sqrt{5}$	2	M1 Accept $10 = k5$ or $\sqrt{20}$ A1 Accept $k = 2$	
	(b)	$25 + (5\sqrt{3}) + (5\sqrt{3}) + (\sqrt{3})^2$	$28 + 10\sqrt{3}$	2	M1 A1 Accept $a = 28, b = 10$	
						Total 4 marks

16.	(a)	Angle of elevation identified $50 \tan 19^\circ$	17.2	3	B1 M1 A1	On diagram or implied by working 17.2 or better (17.2163...)
	(b)	$50^2 + 27^2$ or $56.8(2\dots)$ or $50^2 + "17.2"{}^2$ or value rounding to 52.88.. $\sqrt{"56.8"{}^2 + "17.2"{}^2}$ or $\sqrt{"52.9"{}^2 + 27^2}$	59.3 - 59.4	3	M1 M1 A1	For 59.3 - 59.4
						Total 6 marks

17.	(a)	$(x + 4)(x + 1) - 15 = 35$ $x^2 + 5x + 4 - 15 = 35$	$x^2 + 5x - 11 = 35$	3	M1 B1 A1	For $(x + 4)(x + 1) - 15 = 35$ or $(x + 1)(x + 4) = 50$ For $x^2 + 5x + 4$ or $x^2 + x + 4x + 4$ For $x^2 + 5x + 4 - 15 = 35$ or $x^2 + 5x + 4 = 50$ or simpler
	OR	$(x + 1)(x - 1) + 5(x - 2) = 35$ $x^2 + x - x - 1 + 5x - 10$	$x^2 + 5x - 11 = 35$	3	M1 B1 A1	For $(x + 1)(x - 1) + 5(x - 2) = 35$ For $x^2 + x - x - 1 + 5x - 10$ or simpler For $x^2 + 5x - 1 - 10 = 35$
	(b)	$\frac{-5 \pm \sqrt{5^2 - 4 \times -46}}{2}$ $\frac{-5 \pm \sqrt{209}}{2}$	4.73	3	M1 M1 A1	May be implied by an answer of 4.75 For 4.73 or better (4.7284...) Accept 4.73 and -9.73 or better
						Total 6 marks

18.	(a)	$\frac{9.4}{\sin 123^\circ} = \frac{AC}{\sin 35^\circ}$ $AC = \frac{9.4 \sin 35^\circ}{\sin 123^\circ}$	6.43	3	M1 M1 A1	For 6.43 or better (6.4287...)
	(b)	$\frac{1}{2} \times 9.4 \times "6.43" \times \sin x^\circ$ or $\frac{1}{2} \times AB \times "6.43" \times \sin 123^\circ$ or $\frac{1}{2} \times AB \times 9.4 \times \sin 35^\circ$	11.3	3	M1 B1 A1	For clear attempt to use " $\frac{1}{2}absinC$ " For $x = 22$ or $AB = 4.2$ or better (4.1987...) appropriate for their form of $\frac{1}{2}absinC$ If M0, award for $x = 22$ or $AB = 4.2$ or better (may be shown on diagram) 11.3 or better (11.3188); ft from (a)
						Total 6 marks

19.	(a)	$\frac{3}{6} \times \frac{2}{6}$	$\frac{6}{36}$	2	M1 A1	
	(b)	$\frac{1}{6} \times \frac{1}{6} + \frac{3}{6} \times \frac{3}{6} + \frac{2}{6} \times \frac{2}{6}$ $= \frac{1}{36} + \frac{9}{36} + \frac{4}{36}$	$\frac{14}{36}$	4	M1 M1 M1 A1	1 correct product All 3 correct products Summing at least 2 correct products

	OR	BB BA BN BA BN BA AB AA AN AA AN AA NB NA NN NA NN NA AB AA AN AA AN AA NB NA NN NA NN NA AB AA AN AA AN AA	$\frac{14}{36}$	4	M3 A1	List of all 36 combinations M2 for 1 omission M1 for 15 or more combinations
						Total 6 marks

20.	(a)		16	1	B1	cao
	(b)	$x^3 - 7x + 9 = 11 - x$ or $-x + 11$ oe seen line $x + y = 11$ drawn	$-2.3, -0.3, 2.6$	3	M1 M1 A1	May be implied by line $x + y = 11$ Accept coordinates ft from candidate's line if first M1 scored, line has negative gradient and there are 3 points of intersection
						Total 4 marks
21.	(a)	$\frac{2512}{157}$ or 16 or $\frac{157}{2512}$ or 0.0625 $\sqrt{16}$ or 4 or $\frac{1}{4}$	6.5	3	M1 M1 A1	For $\sqrt{16}$ or 4 or $26^2 \times \frac{157}{2512}$ (42.25) cao

	(b)	4^3 or 64	8320	2	M1 A1	cao
						Total 5 marks
22.		$\frac{2}{x-1} + \frac{x-11}{(x-1)(x+4)}$ $\frac{2(x+4) + (x-11)}{(x-1)(x+4)}$ <p>or</p> $\frac{2(x+4)}{(x-1)(x+4)} + \frac{x-11}{(x-1)(x+4)}$ $\frac{2x+8+x-11}{(x-1)(x+4)}$ $\frac{3x-3}{(x-1)(x+4)}$ $\frac{3(x-1)}{(x-1)(x+4)}$	$\frac{3}{(x+4)}$	6	B1 B1 B1 B1 B1	<p>For factorising $x^2 + 3x - 4$</p> <p>For correct single fraction even if unsimplified, or for correct sum of two fractions with the same denominator ft from incorrect factorisation</p> <p>For expanding brackets correctly in numerator</p> <p>For simplifying their numerator</p> <p>For factorising a correct numerator</p> <p>cao</p>
						SC If no denominator, award 3rd B1 for $2x + 8 + x - 11$ or $2x^2 + 6x - 8 + x^2 - 11x - x + 11$ and 4th B1 for $3x - 3$ or $3x^2 - 6x + 3$
						Total 6 marks
TOTAL FOR PAPER: 100 MARKS						