Gold Level

Mark Scheme 3

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Mark Scheme 3

Time Allowed: **60 minutes**

Score: **/50**

Percentage: **/100**

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	65%	55%	45%	35%	25%	15%	<15%

Question Number	Working	Answer	Mark	Notes
1.	AOC = 70° "70"/360 x π x 9² (=49.48..) 0.5 x 9² x sin "70" = (38.057..) 49.48.. or 38.057... "49.48.." – "38.057.." 11.4		6	B1 Could be marked on diagram. M1ft Area of sector. M1ft Area of triangle. Follow through angles must be the same. A1 Either area correct to 3 sf M1 dep on both previous M1's A1 (11.42253...) awrt 11.4
				Total 6 marks

Question Number	Working	Answer	Mark	Notes
2.	$(\sqrt{3} + 3\sqrt{3})/\sqrt{2}$ $4\sqrt{3}/\sqrt{2}$ $2\sqrt{6}$ or $(\sqrt{48}/\sqrt{2})$ 24		3	M1 Must see $\sqrt{27}$ reduce to $3\sqrt{3}$ alternative $\frac{\sqrt{6}+\sqrt{54}}{2}$ (or better) M1 dep on 1st M1 A1cao dep on M2 Accept $\sqrt{24}$ if M2 awarded.
				Total 3 marks
3.	$\dfrac{4(2 - x) + 3x}{x(2 - x)}$ oe $\dfrac{8 - 4x + 3x}{x(2 - x)}$	$\dfrac{8 - x}{x(2 - x)}$	3	M1 M1 A1 Accept $\dfrac{8 - x}{2x - x^2}$ Single fraction needed as final answer.
				Total 3 marks

4. (a)	$0.5x[(x + 5) +(x +8)] = 42$ (trapezium formula) or $x(x +5) + 0.5x \times(3) = 42$ (partitioning) $x(2x +13) = 84$ or $x^2 +5x + 1.5x = 42$			2	M1 M1 dep on 1st M1 then needs to develop on to quadratic given.

(b)	$(2x + 21)(x – 4)$ $(= 0)$ oe
	
	 $x = 4$
	
	 (P=) "4" +"9" +"12" + $\sqrt{(3^2 + \text{"4"}^2)}$
			30	5	B2 B1 for either factor correct or $(2x \pm 21)(x \pm 4)$
					    or M1 for $x = \dfrac{-13\pm\sqrt{13^2-4 \times 2x-84}}{4}$ (condone 1 sign error)
					    then M1 for $x = \dfrac{-13\pm\sqrt{169+672}}{4}$
					 A1 dep on M1 or B2
					
					 M1 i.e $x + (x +5) + (x + 8) + \sqrt{(3^2 + x^2)}$ in numeric form.
					 A1cao (Last two marks independent)
					 N.B. Working for solving quadratic could be seen in (a) if not contradicted in (b).

					Total 7 marks

5.	(a)		55 115 155 177 190 200	1	B1	cao
	(b)		Points correct	2	B1	± ½ sq ft from sensible table ie clear attempt to add frequencies
			Curve or line segments		B1	ft from points if 4 or 5 correct or ft correctly from sensible table or if points are plotted consistently within each interval at the correct heights Accept curve which is not joined to the origin
	(c)	26 indicated on cf graph		2	M1	for 26 indicated on cf graph – accept 26-27 inc
			approx 60 from correct graph		A1	If M1 scored, ft from cf graph If M1 not scored, ft only from correct curve & if answer is correct (± ½ sq tolerance) award M1 A1
						Total 5 marks

6.	(a)	$\frac{3}{8} + \frac{2}{8}$ oe		2	M1		
			$\frac{5}{8}$		A1		
	(b)(i)	$\frac{2}{8} \times \frac{1}{7}$ appearing once only		5	M1		Sample space method – award 2 marks for correct answer; otherwise no marks
			$\frac{2}{56}$ or $\frac{1}{28}$		A1	for $\frac{2}{56}$ or $\frac{1}{28}$ or for 0.036 or for answer rounding to 0.036	
	(ii)	$\frac{2}{8} \times \frac{3}{7} + \frac{3}{8} \times \frac{2}{7}$ or $2 \times \frac{2}{8} \times \frac{3}{7}$ oe			M1 M1	for one correct product for completely correct expression	
			$\frac{12}{56}$		A1	for $\frac{12}{56}$ oe inc $\frac{3}{14}$ or for 0.21 or for answer rounding to 0.21	
					Note for (b)(ii): sample space method – award 3 marks for correct answer; otherwise no marks SC M1 for $\frac{2}{8} \times \frac{3}{8}$ or $\frac{3}{8} \times \frac{2}{8}$ M1 (dep) for $\frac{2}{8} \times \frac{3}{8} + \frac{3}{8} \times \frac{2}{8}$ oe SC Sample space method – award 2 marks for $\frac{12}{64}$ oe; otherwise no marks		
					Total 7 marks		

7.	(a)		2	1	B1	cao
	(b)		$x < 6$	2	B2	cao B1 for eg $x \leq 6$ or … −2, −1, 0, 1, 2, 3, 4, 5 *SC* B1 for $x \geq 6$
	(c)		7	1	B1	cao
	(d)	g(0) = 15		2	M1	for 15 seen
			3		A1	cao If M0, award B1 for ± 3 oe
	(e)	$k = 12$		3	M1	May be stated or indicated on diagram. May be implied by one correct solution.
			−0.7 or −0.8 3.8		A2	A1 for solution rounding to −0.7 or −0.8 A1 for solution rounding to 3.8
	(f)	tan drawn at $x = 3.5$		3	M1	tan or tan produced passes between points (3, $3 \leq y \leq 6$) and (4, $11 \leq y \leq 14$)
		$\dfrac{\text{vertical difference}}{\text{horizontal difference}}$			M1	finds their $\dfrac{\text{vertical difference}}{\text{horizontal difference}}$ for two points on tan or finds their $\dfrac{\text{vertical difference}}{\text{horizontal difference}}$ for two points on curve, where one of the points has an *x*-coordinate between 3 and 3.5 inc and the other point has an *x*-coordinate between 3.5 and 4 inc
			6.5 – 11 inc		A1	dep on both M marks
						Total 12 marks

8.	$(\cos x° =)\dfrac{4^2 + 6^2 - 8^2}{2 \times 4 \times 6}$ or $8^2 = 4^2 + 6^2 - 2 \times 4 \times 6 \cos x°$		3	M1	for correct substitution in Cosine Rule
	$(\cos x° =)\ -0.25$ oe			A1	
		104.5		A1	for value rounding to 104.5 (104.4775…)
					Total 3 marks

9.	(a)		2	B2	for all correct B1 for 2 or 3 correct
	(b)(i)	10	2	B1	cao
	(ii)	25		B1	cao
					Total 4 marks