

# Gold Level

## Mark Scheme 8

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Difficulty Level	Gold
Booklet	Mark Scheme 8

**Time Allowed:** 60 minutes

**Score:** /50

**Percentage:** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

Question Number	Working	Answer	Mark	Notes
1 (a)		Points correct	2	B1 + ½ sq
	Curve or line segments			B1 ft from points if 4 or 5 correct or if points are plotted consistently within 50-60, 60-70, 70-80 etc at the correct heights Ignore any attempt at curve to left of first plotted point
(b)	30 (or 30.5) indicated on cumulative frequency graph or stated		2	M1 for 30 (or 30.5) indicated on cumulative frequency axis or stated
		approx 66		A1 If M1 scored, ft from <i>their</i> cumulative frequency graph  If M1 not scored, ft only from correct curve & if answer is correct (+ ½ sq tolerance) award M1 A1
				<b>Total 4 marks</b>

2	<b>NB : M2 cannot be awarded if angles are marked incorrectly on the diagram</b> 180 – 77 – 39 or $\angle BAD = 77^\circ$ and $\angle ABD = 39^\circ$ or $\angle BA"x" = 64^\circ$ where $x$ is on $PA$ produced or a fully correct method to find angle $ADB$		3	M2 also accept 103 – 39  M1 for $\angle BAD = 77^\circ$ or $\angle ABD = 39^\circ$	Angles may be stated or marked on diagram
		64		A1 cao	
				<b>Total 3 marks</b>	

3	(a)	$\frac{PR}{5} = \frac{14}{8}$ or $\frac{PR}{14} = \frac{5}{8}$		2	M1 or for $5 \times \frac{14}{8}$ oe
			8.75		A1
	(b)	$\frac{14}{8}$ or $\frac{7}{4}$ or 1.75 or $\frac{8}{14}$ or $\frac{4}{7}$ or 0.571... (May be implied by second M1) Allow ratio notation		3	M1 Alternative method M1 for $\frac{1}{2} \times 8 \times 5 \times \sin A$ and $\sin A = 0.8$
		$1.75^2$ oe eg 3.0625, $\frac{49}{16}$ or $\left(\frac{4}{7}\right)^2$ oe eg $\frac{16}{49}$ , 0.326... allow ratio notation			M1 M1 (dep) for $\frac{1}{2} \times 14 \times 8.75 \times 0.8$
			49		A1 cao SC : B1 for an answer of 28
					<b>Total 5 marks</b>

4	(a)	$0.3 \times 0.1$ <b>or</b> $(1 - 0.7) \times 0.1$ and no other terms		2	M1	
			0.03 oe		A1	
	(b)	$0.7 \times 0.8$ <b>or</b> $0.7 \times (1 - 0.2)$ <b>or</b> $0.3 \times 0.9$ <b>or</b> $(1 - 0.7) \times (1 - 0.1)$		3	M1	M1 for "(a)" + $0.7 \times 0.2$ <b>or</b> $0.3 \times 0.1 + 0.7 \times 0.2 (=0.17)$ <b>or</b> $(1 - 0.7) \times 0.1 + 0.7 \times 0.2$
		$0.7 \times 0.8 + 0.3 \times 0.9$ <b>or</b> $0.7 \times (1 - 0.2) + (1 - 0.7) \times (1 - 0.1)$			M1	M1 for $1 - ("(a)" + 0.7 \times 0.2)$ <b>or</b> $1 - "0.17"$ (M2 for $1 - "(a)" - 0.7 \times 0.2$ )
			0.83 oe		A1	
<b>Total 5 marks</b>						

5		$\frac{2.9}{\sin 36^\circ} = \frac{QS}{\sin(180 - 62)^\circ}$		3	M1	for correct substitution into the Sine Rule	Condone use of 62 instead of 118
		$(QS =) \frac{2.9 \sin "118"^\circ}{\sin 36^\circ}$ oe			M1	for correct rearrangement (there may be partial evaluation)	
			4.36		A1	for awrt 4.36	
<b>Total 3 marks</b>							

6	(a)	$3.65 \times 6$		2	M1	for 3.65 or $3.64\dot{9}$ or 3.6499...
			21.9		A1	Also accept $21.8\dot{9}$ or 21.899...
	(b)	$75$ <b>or</b> $12.5$ <b>or</b> $12.4\dot{9}$		3	M1	
		$\frac{75}{12.5}$ <b>or</b> $75 = w \times 12.5$ <b>or</b> $\frac{75}{12.4\dot{9}}$ <b>or</b> $75 = w \times 12.4\dot{9}$			M1	for 75 <b>and</b> 12.5 (or $12.4\dot{9}$ ) used correctly
				6	A1	cao dep on both method marks
<b>Total 5 marks</b>						

7	(a)	$\frac{20-2x}{2}$ or $10-x$ seen as the width or $\sqrt{8^2-x^2}$ oe		4	B1
		$x^2 + (10-x)^2 = 8^2$ <b>or</b> $x^2 + (10-x)^2 = 64$ <b>or</b> $2x + 2\sqrt{8^2-x^2} = 20$ <b>or</b> $x + \sqrt{8^2-x^2} = 10$			M1 accept $\frac{20-2x}{2}$ in place of $10-x$ for all method marks
		$x^2 + 100 - 10x - 10x + x^2 = 64$ <b>or</b> $(2\sqrt{8^2-x^2})^2 = 400 - 40x - 40x + 4x^2$ <b>or</b> $(\sqrt{8^2-x^2})^2 = 100 - 10x - 10x + x^2$			M1 (dep on previous M1) for correct expansion of $(10-x)^2$ <b>or</b> correct expansion of $(20-2x)^2$
			$x^2 - 10x + 18 = 0$		A1 for correct manipulation resulting in given equation
	(b)	$\frac{- -10 \pm \sqrt{(-10)^2 - 4 \times 1 \times 18}}{2 \times 1}$ <b>or</b> for this expression with one or more of $(- -10)$ , $(-10)^2$ , $10^2$ , $-4 \times 1 \times$ $18$ , $2 \times 1$ , $(-10)^2 - 4 \times 1 \times 18$ evaluated e.g. $\frac{10 \pm \sqrt{28}}{2}$		3	M1 correct substitution brackets not necessary (accept $10^2$ )  <b>or</b> $(x-5)^2 - 25 + 18 = 0$ oe
		$\sqrt{28}$ <b>or</b> $2\sqrt{7}$ <b>or</b> $\sqrt{100-72}$ <b>or</b> 5.29...			M1 (independent) for correct simplification of discriminant (if evaluated at least 3sf rounded or truncated)  <b>or</b> $x - 5 = \pm\sqrt{7}$ oe

		2.35 7.65		A1	for values rounding to 2.35 and 7.65 (2.35424... 7.64575...) Award full marks for correct solutions if at least 1 method mark scored.
					<b>Total 7 marks</b>

8	$\frac{1}{2} \times 7 \times 16 \times \sin 150^\circ$		6	M1	for $\frac{1}{2} \times 7 \times 16 \times \sin 150^\circ$
				M1	for $\pi \times 7^2$ <b>or</b> $49\pi$ <b>or</b> for value rounding to 153.9
	$\frac{210}{360} \times \pi \times 7^2$ <b>or</b> $\pi \times 7^2 - \frac{150}{360} \times \pi \times 7^2$			M2	correct method for sector of circle M1 for $\frac{210}{360}$ oe inc 0.5833... rounded or truncated to at least 3 decimal places or for $\frac{360}{210}$ oe inc 1.714... rounded or truncated to at least 2 decimal places
				A1	for value rounding to 89.8 or $\frac{343\pi}{12}$ for area of sector <b>or</b> 28 for area of triangle
		118		A1	for value rounding to 118
					<b>Total 6 marks</b>

9	$\frac{y(x+4)}{x(x+4)} + \frac{2xy}{x(x+4)} = 3$ <b>or</b> $\frac{y(x+4)}{x(x+4)} + \frac{2xy}{x(x+4)} = \frac{3x(x+4)}{x(x+4)}$		5	M1	LHS may be two separate fractions or one single fraction  (brackets may or may not be removed on RHS and denominator)
	$y(x+4) + 2xy = 3x(x+4)$ <b>or</b> $\frac{xy+4y}{x(x+4)} + \frac{2xy}{x(x+4)} = 3$ <b>or</b> $\frac{xy+4y}{x(x+4)} + \frac{2xy}{x(x+4)} = \frac{3x(x+4)}{x(x+4)}$			M1	LHS may be two separate fractions or one single fraction; if one fraction, numerator on LHS may or may not be simplified <b>(implies previous M1)</b>  (brackets may or may not be removed on RHS and denominator)
	$xy + 4y + 2xy = 3x^2 + 12x$ <b>or</b> $xy + 4y - 2xy = 3x(x+4)$ <b>or</b> $3xy + 4y = 3x^2 + 12x$ <b>or</b> $3xy + 4y = 3x(x+4)$			M1	(brackets may or may not be removed on RHS)  <b>(implies previous two M1s)</b>
	$y(3x+4) = 3x(x+4)$ <b>or</b> $y(3x+4) = 3x^2 + 12x$			M1	LHS factorised correctly - expression in bracket on LHS may or may not be simplified
		$\frac{3x(x+4)}{3x+4}$		A1	$\frac{3x(x+4)}{3x+4}$ or $\frac{3x^2 + 12x}{3x+4}$ a fully correct method must be seen in order to award full marks
					<b>Total 5 marks</b>

10 (a) (i)	u, p, e, r	1	B1	Allow in any order Brackets and commas not necessary
(ii)	s, c, o, m, p, u, t, e, r	1	B0 if 'p' or 'u' or 'e' or 'r' are repeated	
(b)	no  2 (or 3) are prime 2 (or 3) belongs to X & Y etc	1	B1	- identifies the element 2 or 3 <b>or</b> 2 and 3 - dependent on "No" box ticked <b>or</b> "No" stated in answer with neither box ticked allow eg
				<b>Total 3 marks</b>

11 (a)	$8 \times \frac{8}{5}$ oe	12.8 oe	2	M1	
(b)	$12 \times 1.6^2$	30.72	2	A1	M1 for $1.6^2 (=2.56)$ <b>or</b> $0.625^2 (=0.39..)$ <b>or</b> $\left(\frac{8}{5}\right)^2 \left(=\frac{64}{25}\right)$ <b>or</b> $\left(\frac{5}{8}\right)^2 \left(=\frac{25}{64}\right)$ or $0.5 \times 8 \times "12.8" \times \sin 36.9$ cao
				<b>Total 4 marks</b>	