

Question	Scheme	Marks	AOs
10(a)	Attempts to find the radius $\sqrt{(2-2)^2 + (5-3)^2}$ or radius ²	M1	1.1b
	Attempts $(x-2)^2 + (y-5)^2 = 'r'^2$	M1	1.1b
	Correct equation $(x-2)^2 + (y-5)^2 = 20$	A1	1.1b
		(3)	
(b)	Gradient of radius OP where O is the centre of $C = \frac{5-3}{2-2} = \left(\frac{1}{2}\right)$	M1	1.1b
	Equation of l is $-2 = \frac{y-3}{x+2}$	dM1	3.1a
	Any correct form $y = -2x - 1$	A1	1.1b
	Method of finding k Substitute $x = 2$ into their $y = -2x - 1$	M1	2.1
	$k = -5$	A1	1.1b
		(5)	

(8 marks)

Notes:

(a)

M1: As scheme or states form of circle is $(x-2)^2 + (y-5)^2 = 'r'^2$

M1: As scheme or substitutes $(-2,3)$ into $(x-2)^2 + (y-5)^2 = 'r'^2$

A1: For a correct equation

If students use $x^2 + y^2 + 2fx + 2gy + c = 0$ **M1:** $f = 2, g = 5$ **M1:** substitutes $(2,5)$ to find value of c

A1: $x^2 + y^2 - 4x - 10y + 9 = 0$

(b)

M1: Attempts to find the gradient of OP where O is the centre of C

dM1: For a complete strategy of finding the equation of l using the perpendicular gradient to OP and the point $(-2,3)$..

A1: Any correct form of l Eg $y = -2x - 1$

M1: Scored for the key step of finding k . In this method they are required to substitute $(2,k)$ in their $y = -2x - 1$ and solve for k .

A1: $k = -5$

Alt using Pythagoras' theorem

M1: Attempts Pythagoras to find both PQ and OQ in terms of k (where O is centre of C)

dM1: For the complete strategy of using Pythagoras theorem on triangle POQ to form an equation in k

A1: A correct equation in k Eg. $20 + (k-3)^2 + 16 = (k-5)^2$

M1: Scored for a correct attempt to solve their quadratic to find k .

A1: $k = -5$