

Q	Marking instructions	AO	Marks	Typical solution
7(a)(i)	Obtains centre = (3,4) Accept $a = 3$ , $b = 4$	1.1b	B1	Centre (3,4)
	<b>Subtotal</b>		<b>1</b>	

Q	Marking instructions	AO	Marks	Typical solution
7(a)(ii)	Rearranges into a standard form with $(x \pm 3)^2 + (y \pm 4)^2$ seen or Forms an expression for radius of the form $\sqrt{(\pm 3)^2 + (\pm 4)^2 \pm p}$  This working can be seen in part (a)(i)	1.1a	M1	$x^2 + y^2 = 6x + 8y + p$ $x^2 + y^2 - 6x - 8y - p = 0$ $(x - 3)^2 + (y - 4)^2 - 9 - 16 - p = 0$ $(x - 3)^2 + (y - 4)^2 = 25 + p$
	Obtains $(x - 3)^2 + (y - 4)^2 = 25 + p$ Or Obtains $\sqrt{3^2 + 4^2 + p}$	1.1b	A1	Radius = $\sqrt{25 + p}$
	States radius = $\sqrt{25 + p}$	1.1b	A1	
	<b>Subtotal</b>		<b>3</b>	

Q	Marking instructions	AO	Marks	Typical solution
7(b)	Begins to solve the problem by either Sketching (part of) a circle which goes through the origin or Sketching (part of) a circle that touches one of the axes or Substituting either $x = 0$ or $y = 0$ into their circle equation – must involve $p$ PI by correctly formed equation involving $p$	3.1a	M1	Circle passes through the origin $\sqrt{25 + p} = 5$ $\Rightarrow p = 0$  Circle just touches $x$ -axis $\sqrt{25 + p} = 4$ $\Rightarrow p = -9$
	Forms an equation to find $p$ By either Equating their expression for the radius to 5 or the greater value of their $a$ and $b$ or Substituting both $x = 0$ and $y = 0$ into their circle equation to form an equation in terms of $p$ only or Substituting $y = 0$ and using $b^2 - 4ac = 0$ to form an equation in terms of $p$ only	3.1a	M1	

	Deduces $p = 0$	2.2a	R1	
	Deduces $p = -9$	2.2a	R1	
	<b>Subtotal</b>		<b>4</b>	

	<b>Question Total</b>		<b>8</b>	
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