Question Number	Scheme	Marks
3(a)	Attempts to complete the square for both variables $\left(x+4\right)^2,\left(y-7\right)^2$	M1
	Centre $\left(-4,7\right)$	A1
	Radius = 12	A1
		(3)
(b)	Attempts $"\pm\left(12"-\sqrt{"4"^2+"7"^2}\right)$	M1
	$12-\sqrt{65}$	A1 ft
		(2)
		Total 5

(a)

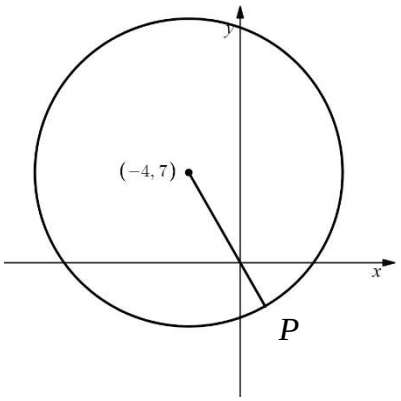
M1: Attempts to complete the square for **both** variables. Score for sight of $\left(x+4\right)^2...\left(y-7\right)^2$

Condone $\left(x\pm4\right)^2,\left(y\pm7\right)^2$ or even with a negative between. It is implied by a centre of $\left(\pm4,\pm7\right)$

A1: Centre $\left(-4,7\right)$

A1: Radius = 12. May be awarded following a centre of $\left(\pm4,\pm7\right)$

(b)



M1: Attempts $\pm\left("12"-\sqrt{"4"^2+"7"^2}\right)$ which may be in decimals. Look for $\pm\left(12-8.06\right)$ or ±3.94 following a correct (a)

Must be an attempt at subtraction of $"12"$ and $\sqrt{"4"^2+"7"^2}$ either way around and not addition

A1ft: $12-\sqrt{65}$ but ft on their $12-\sqrt{65}$ which must be exact and positive. ISW if followed by the decimal answer

……

Alt (b): You may see various attempts using the intersection of their $y=-\frac{7}{4}x$ and the equation of the circle.

The method mark is scored when the equations are solved to find coordinates for *P* followed by the calculation of distance *OP*.

M1: Equates their $y=-\frac{7}{4}x$ (must agree with their centre) with either the original equation or their adapted equation to set up a 3 term quadratic equation in either *x* or *y*. This must be solved by an appropriate method which includes use of calculator (you may need to check if just answers are given). Once a value of *x* and *y* have been found, score for the use of Pythagoras' theorem (e.g. $\sqrt{x^2+y^2}$) to find the length. It is highly unlikely that an exact answer could be found via this route.

Question Number	Scheme	Marks
4 (a)	$(3+2x)^6$	
	First term 3^6 or 729	B1
	Term in x, x^2 or x^3: Award for one of ${}^6C_5(3)^5(2x)^1$, ${}^6C_4(3)^4(2x)^2$ or ${}^6C_3(3)^3(2x)^3$	M1
	Two of $...+2916x+4860x^2+4320x^3+...$	A1
	$(3+2x)^6 = 729+2916x+4860x^2+4320x^3+...$	A1
		(4)
(b)	Attempts one correct term $2x^2\times"729"$ **or** $\pm\frac{1}{6x}\times"4320"x^3$	M1
	Attempts to combine the correct two terms $2x^2\times"729"\pm\frac{1}{6x}\times"4320"x^3=...x^2$	dM1
	738 but condone $738x^2$	A1
		(3)
		Total 7

(a)

B1: Correct first term 3^6 or 729 which must be seen in part (a)

M1: Correct attempt at term 2, 3 or 4. Condone a missing bracket.

Look for the correct binomial coefficient (C notation or bracket form), the correct power of 3 and the correct power of *x*.

So condone attempts such as ${}^6C_4(3)^4\,2x^2$ and even ${}^6C_3(3)^3\,x^3$

If there isn't an intermediate form given, then the mark is awarded for a correct term 2, 3 or 4.

A1: Two correct and simplified of $...+2916x+4860x^2+4320x^3+...$

A1: $(3+2x)^6 = 729+2916x+4860x^2+4320x^3+....$ Allow this to be given/written as a list.

ISW after a correct answer

(b)

M1: Attempts one of the two terms (or one of the two coefficients required to find the coefficient of x^2).

Look for $2x^2\times"729"$ **or** $\pm\frac{1}{6x}\times"4320"x^3$ which may be seen amongst a larger list or sum of terms.

Condone slips, e.g 729 written as 792 but the 2 and/or the $\frac{1}{6}$ must be used correctly.

dM1: Attempts the term in x^2 or the coefficient in x^2 using a correct combination of terms.

Look for $2x^2\times"729"\pm\frac{1}{6x}\times"4320"x^3$ leading to a single term in x^2 or the combined coefficient of x^2

A1: 738 but condone $738x^2$.