

$$\begin{aligned}
& x^2 + y^2 - 8x + 2y + 8 = 0 \\
& \implies (x^2 - 8x) + (y^2 + 2y) + 8 = 0 \\
& \implies (x^2 - 2x(4) + 4^2 - 4^2) + (y^2 + 2y(1) + 1^2 - 1^2) + 8 = 0 \\
& \implies (x^2 - 2x(4) + 4^2) + (y^2 + 2y(1) + 1^2) + 8 - 4^2 - 1^2 = 0 \\
& \implies (x - 4)^2 + (y + 1)^2 - 9 = 0 \\
& \implies (x - 4)^2 + (y + 1)^2 = 9 \\
& \implies (x - 4)^2 + (y + 1)^2 = 3^2 \\
& \implies (x - 4)^2 + (y - (-1))^2 = 3^2
\end{aligned}$$

Comparing with the general equation of circle with center at  $(x_0, y_0)$  and radius  $r$  ;

$$(x - x_0)^2 + (y - y_0)^2 = r^2 .$$

so, we get

$$x_0 = 4 \text{ and } y_0 = -1 \text{ and } r = 3.$$

Hence the given equation represents the circle with center at  $(x_0, y_0) = (4, -1)$  and having radius=  $r = 3$ .