

$(x-h)^2 + (y-k)^2 = r^2$ Standard form
 Complete the square: general form

① $x^2 - 10x + y^2 + 16 = 0$

$(x^2 - 10x + 25) + y^2 = -16 + 25$

$(x-5)^2 + y^2 = 9$

$(5, 0) \quad r = 3$

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② $x^2 + y^2 + 6y = 36$

$x^2 + (y^2 + 6y + 9) = 36 + 9$

$x^2 + (y+3)^2 = 45$

$(0, -3) \quad r = \sqrt{45} = 3\sqrt{5}$

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③ $3x^2 + 3y^2 + 12x - 18y = 9$

$x^2 + y^2 + 4x - 6y = 3$

$(x^2 + 4x + 4) + (y^2 - 6y + 9) = 3 + 4 + 9$

$(x+2)^2 + (y-3)^2 = 16 + 9$

center $(-2, 3) \quad r = 5$

OR

$(3x^2 + 12x) + (3y^2 - 18y) = 9$

$3(x^2 + 4x) + 3(y^2 - 6y) = 9$

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⑩

Diagram showing a circle with center $(-1, -1)$ and radius r . Points $(-4, -1)$ and $(2, -3)$ are on the circle.

midpt $\frac{-4+2}{2}, \frac{-1+3}{2}$

center: $(-1, -1)$

$(x+1)^2 + (y+1)^2 = r^2$

$(-4+1)^2 + (-1+1)^2 = r^2$

$9 + 0 = r^2$

$3 = r$

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