

Converting From Standard to General Form

$$(x-h)^2 + (y-k)^2 = r^2 \rightarrow x^2 + y^2 + Cx + Dy + E = 0$$

ex: $(x-2)^2 + (y+3)^2 = 5$ center $(2, -3)$ radius $= \sqrt{5} \approx 2.2$
 $(x-2)(x-2) + (y+3)(y+3) = 5$

$$x^2 - \underline{2x} - \underline{2x} + 4 + y^2 + \underline{3y} + \underline{3y} + 9 = 5$$

$$x^2 - 4x + y^2 + 6y + 13 = 5$$

$$x^2 + y^2 - 4x + 6y + 13 = 5$$

$$x^2 + y^2 - 4x + 6y + 8 = 0 \quad \text{General Form}$$

ex: $(x+6)^2 + (y-1)^2 = 16$ center $(-6, 1)$ radius $= 4$

$$(x+6)(x+6) + (y-1)(y-1) = 16$$

$$x^2 + \underline{6x} + \underline{6x} + 36 + y^2 - \underline{1y} - \underline{1y} + 1 = 16$$

$$x^2 + 12x + y^2 - 2y + 37 = 16$$

$$x^2 + y^2 + 12x - 2y + 37 = 16$$

$$x^2 + y^2 + 12x - 2y + 21 = 0 \quad \text{General Form}$$