

Standard Forms of Conic Sections

Parabola

$$y = a \cdot (x - h)^2 + k$$

$$x = a \cdot (y - k)^2 + h$$

Ellipse

$$\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$$

Circle

$$(x - h)^2 + (y - k)^2 = r^2$$

Hyperbola

$$\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$$

$$\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$$

Classify the following conic and put its equation in standard form.

$$x^2 - 12x - y + 20 = 0$$

Classify the following conic and put its equation in standard form.

$$x^2 + y^2 + 4x - 6y - 12 = 0$$

Classify the following conic and put its equation in standard form.

$$x^2 + 4y^2 - 2x - 8y + 1 = 0$$

Classify the following conic and put its equation in standard form.

$$4x^2 - 9y^2 - 16x - 36y - 164 = 0$$

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$$\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$$

Complete the Square

Circle

$$(x - h)^2 + (y - k)^2 = r^2$$

Hyperbola

$$\frac{(x - h)^2}{a^2} - \frac{(y - k)^2}{b^2} = 1$$

$$\frac{(y - k)^2}{a^2} - \frac{(x - h)^2}{b^2} = 1$$