Name _____

Classifying Conics from Expanded Equations

Date _____ Period _____

Standard Forms of Conic Sections

Parabola

$$(y-k)^2 = 4a(x-h)$$

$$(x-h)^2 = 4a(y-k)$$

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 conics that each equation represents

$$\frac{(x-2)^2}{16} + \frac{(y+4)^2}{25} = 1$$

$$(x-5)^2 + (y+4)^2 = 64$$

$$(x+2)^2 = -(y+6)$$

$$\frac{(x+2)^2}{1} - \frac{(y-5)^2}{81} = 1$$

$$\frac{(y-2)^2}{4} - \frac{(x+4)^2}{9} = 1$$

$$(y-5)^2 = 8(x+4)$$

Classify the following conics that each equation represents

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

$2y^2 + 2x^2 + 6y + 4x - 10 = 0$

$9x^2 - 18x + 4y^2 + 16y - 11 = 0$

$y^2 + 12y + x + 1 = 0$

$x^2 + 8x - 3y^2 - 6y + 4 = 0$

$x^2 + 9y^2 + 6x - 18y = -9$

Classifying Conics (Analyze the Squared Terms)			
Parabola	1 squared term		
Circle	2 squared terms	same sign	same coefficient
Ellipse	2 squared terms	same sign	different coefficients
Hyperbola	2 squared terms	different signs	

Classify the following conics that each equation represents

$y^2 - 2y - 4x^2 - 16x = 19$

$4x^2 + 8x + 4y^2 + 16y + 6 = 0$

$4x^2 + 8x + 3y^2 - 6y - 5 = 0$

$2y^2 - x^2 + 2x + 8y + 3 = 0$

$x^2 + 2x + 5y - 13 = 0$

$4y^2 + 8y - 5x = 6$

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Parabola	1 squared term		
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Classify the following conics that each equation represents

Parabola	Circle	Ellipse	Hyperbola
$(y-k)^2 = 4a(x-h)$ $(x-h)^2 = 4a(y-k)$	$(x-h)^2 + (y-k)^2 = r^2$	$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$	$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$ $\frac{(y-k)^2}{a^2} - \frac{(x-h)^2}{b^2} = 1$

Classifying Conics (Analyze the Squared Terms)			
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