

WS - Conics Review

Date _____ Period _____

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Classify each conic section and write its equation in standard form. For parabolas, identify the vertex, focus, and length of the latus rectum. For circles, identify the center and radius. For ellipses and hyperbolas identify the center, vertices, foci, and length of the latus rectum.

1) $y^2 + x + 2y - 1 = 0$

2) $x^2 + y^2 + 2x - 2y - 1 = 0$

3) $x^2 + y^2 + 6x + 6y + 9 = 0$

4) $-x^2 + y - 3 = 0$

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

6) $x^2 + 9y^2 - 2x - 90y + 190 = 0$

7) $49x^2 + y^2 - 49 = 0$

8) $-4x^2 + 9y^2 + 8x - 18y - 31 = 0$

9) $x^2 + y^2 + 8x - 4y + 12 = 0$

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

11) $x^2 + 4y^2 + 2x - 16y - 19 = 0$

12) $-x^2 + y^2 - 25 = 0$

13) $x^2 + y^2 + 2x + 6y + 1 = 0$

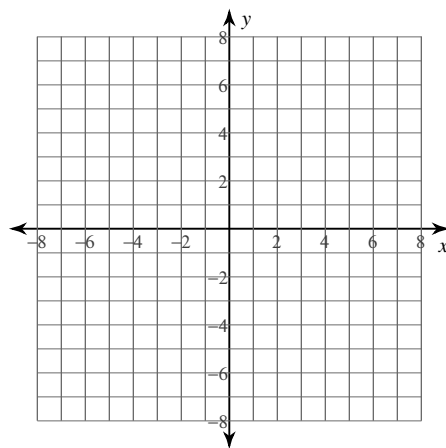
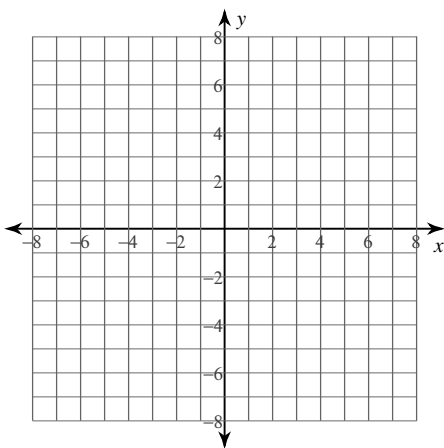
14) $-x^2 + y^2 + 2x - 2y - 15 = 0$

15) $x^2 - y^2 + 2x - 2y - 15 = 0$

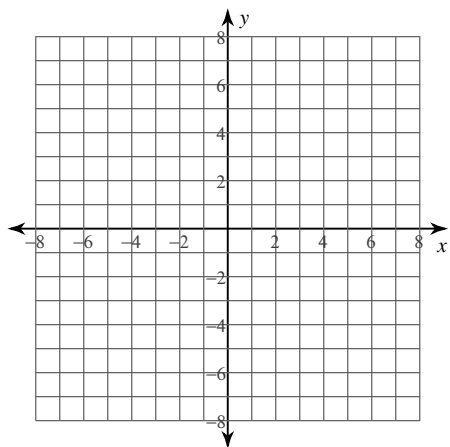
Sketch the graph of each conic section. For parabolas, identify the vertex and focus. For circles, identify the center and radius. For ellipses and hyperbolas identify the center, vertices, and foci.

16) $y^2 + x + 10y + 21 = 0$

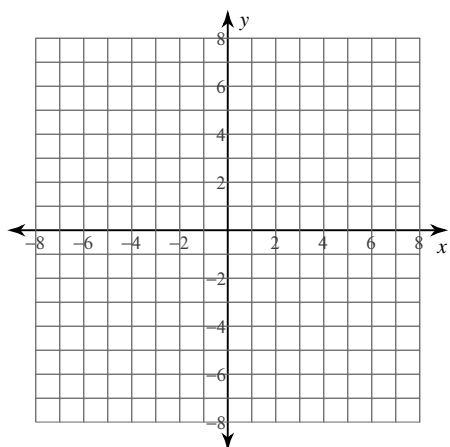
17) $-2y^2 + x + 8y - 2 = 0$



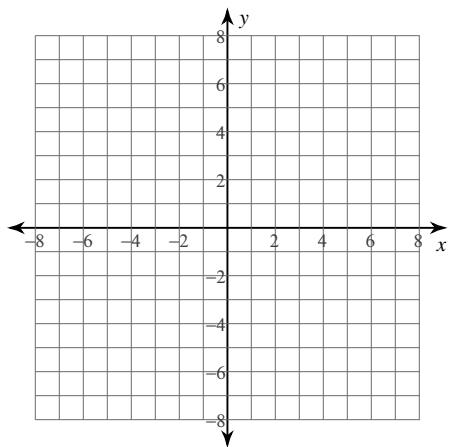
18) $x^2 + y^2 - 2x + 4y + 1 = 0$



19) $x^2 + 16y^2 - 2x + 64y + 49 = 0$



20) $-x^2 + 9y^2 - 2x - 54y + 71 = 0$



Answers to WS - Conics Review (ID: 1)

1) Parabola

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

Vertex: $(2, -1)$

$$\text{Focus: } \left(\frac{7}{4}, -1\right)$$

Latus Rectum: 1 unit

4) Parabola

$$y = x^2 + 3$$

Vertex: $(0, 3)$

$$\text{Focus: } \left(0, \frac{13}{4}\right)$$

Latus Rectum: 1 unit

2) Circle

$$(x + 1)^2 + (y - 1)^2 = 3$$

Center: $(-1, 1)$

$$\text{Radius: } \sqrt{3}$$

5) Parabola

$$x = \frac{1}{2}y^2 + 2$$

Vertex: $(2, 0)$

$$\text{Focus: } \left(\frac{5}{2}, 0\right)$$

Latus Rectum: 2 units

3) Circle

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

Center: $(-3, -3)$

Radius: 3

6) Ellipse

$$\frac{(x - 1)^2}{36} + \frac{(y - 5)^2}{4} = 1$$

Center: $(1, 5)$

Vertices: $(7, 5), (-5, 5)$

Foci: $(1 + 4\sqrt{2}, 5), (1 - 4\sqrt{2}, 5)$

Latus Rectum: $\frac{4}{3}$ units

7) Ellipse

$$x^2 + \frac{y^2}{49} = 1$$

Center: $(0, 0)$

Vertices: $(0, 7), (0, -7)$

Foci: $(0, 4\sqrt{3}), (0, -4\sqrt{3})$

Latus Rectum: $\frac{2}{7}$ units

8) Hyperbola

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

Center: $(1, 1)$

Vertices: $(1, 3), (1, -1)$

Foci: $(1, 1 + \sqrt{13}), (1, 1 - \sqrt{13})$

Latus Rectum: 9 units

9) Circle

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

Center: $(-4, 2)$

Radius: $2\sqrt{2}$

10) Parabola

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

Vertex: $(3, 3)$

$$\text{Focus: } \left(\frac{11}{4}, 3\right)$$

Latus Rectum: 1 unit

11) Ellipse

$$\frac{(x + 1)^2}{36} + \frac{(y - 2)^2}{9} = 1$$

Center: $(-1, 2)$

Vertices: $(5, 2), (-7, 2)$

Foci: $(-1 + 3\sqrt{3}, 2), (-1 - 3\sqrt{3}, 2)$

Latus Rectum: 3 units

12) Hyperbola

$$\frac{y^2}{25} - \frac{x^2}{25} = 1$$

Center: $(0, 0)$

Vertices: $(0, 5), (0, -5)$

Foci: $(0, 5\sqrt{2}), (0, -5\sqrt{2})$

Latus Rectum: 10 units

13) Circle

$$(x + 1)^2 + (y + 3)^2 = 9$$

Center: $(-1, -3)$

Radius: 3

14) Hyperbola

$$\frac{(y - 1)^2}{15} - \frac{(x - 1)^2}{15} = 1$$

Center: $(1, 1)$

Vertices: $(1, 1 + \sqrt{15}), (1, 1 - \sqrt{15})$

Foci: $(1, 1 + \sqrt{30}), (1, 1 - \sqrt{30})$

Latus Rectum: $2\sqrt{15}$ units

15) Hyperbola

$$\frac{(x+1)^2}{15} - \frac{(y+1)^2}{15} = 1$$

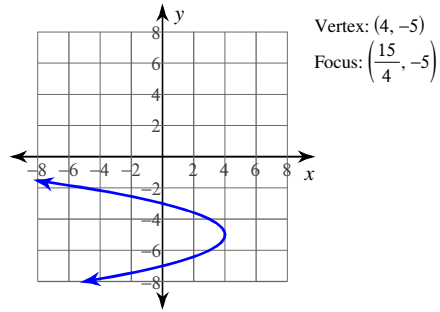
Center: $(-1, -1)$

Vertices: $(-1 + \sqrt{15}, -1), (-1 - \sqrt{15}, -1)$

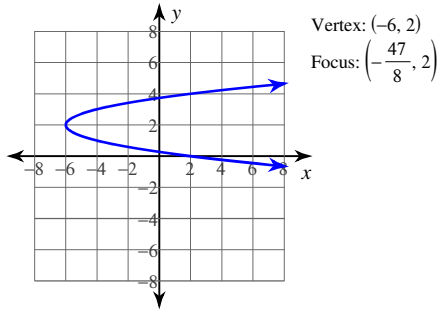
Foci: $(-1 + \sqrt{30}, -1), (-1 - \sqrt{30}, -1)$

Latus Rectum: $2\sqrt{15}$ units

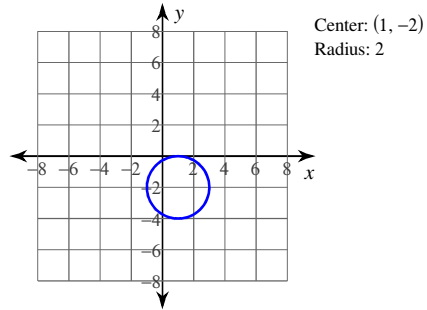
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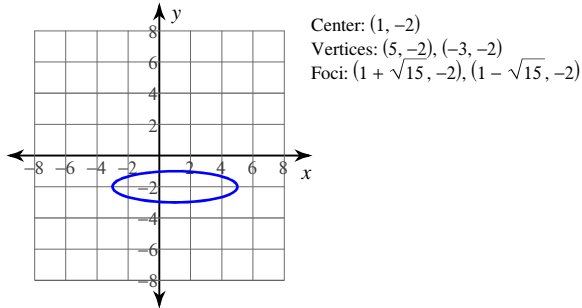
17)



18)



19)



20)

