Algebra 2   Name_____

Assignment
Date_____ Period_____

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

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

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

3) $\dfrac{x^2}{49} + \dfrac{(y-4)^2}{4} = 1$

4) $x^2 + (y-2)^2 = 18$

5) $\dfrac{y^2}{20} - \dfrac{x^2}{25} = 1$

6) $y = -\dfrac{1}{2}(x+1)^2 + 2$

Classify each conic section. For parabolas, identify the vertex and focus. For circles, identify the center. For ellipses and hyperbolas identify the center, vertices, and foci.

7) $4x^2 + 9y^2 + 16x - 90y + 205 = 0$

8) $x^2 + y^2 + 6y + 7 = 0$

9) $-3x^2 - 36x + y - 104 = 0$

10) $x^2 + 6x + y + 7 = 0$

11) $49x^2 + y^2 - 294x + 392 = 0$

12) $25x^2 - 9y^2 - 50x - 200 = 0$

13) $9x^2 + 16y^2 + 128y + 112 = 0$

14) $5x^2 - 3y^2 - 10x - 70 = 0$

15) $-5x^2 + 3y^2 - 75 = 0$

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

Answers to Assignment (ID: 1)

1) Parabola
$$y = -(x + 2)^2 - 2$$
Vertex: $(-2, -2)$
Focus: $\left(-2, -\dfrac{9}{4}\right)$

2) Circle
$$(x - 2)^2 + (y - 2)^2 = 9$$
Center: $(2, 2)$

3) Ellipse
$$\dfrac{x^2}{49} + \dfrac{(y - 4)^2}{4} = 1$$
Center: $(0, 4)$
Vertices: $(7, 4)$, $(-7, 4)$
Foci: $(3\sqrt{5}, 4)$, $(-3\sqrt{5}, 4)$

4) Circle
$$x^2 + (y - 2)^2 = 18$$
Center: $(0, 2)$

5) Hyperbola
$$\dfrac{y^2}{20} - \dfrac{x^2}{25} = 1$$
Center: $(0, 0)$
Vertices: $(0, 2\sqrt{5})$, $(0, -2\sqrt{5})$
Foci: $(0, 3\sqrt{5})$, $(0, -3\sqrt{5})$

6) Parabola
$$y = -\dfrac{1}{2}(x + 1)^2 + 2$$
Vertex: $(-1, 2)$
Focus: $\left(-1, \dfrac{3}{2}\right)$

7) Ellipse
Center: $(-2, 5)$
Vertices: $(1, 5)$, $(-5, 5)$
Foci: $(-2 + \sqrt{5}, 5)$, $(-2 - \sqrt{5}, 5)$

8) Circle
Center: $(0, -3)$

9) Parabola
Vertex: $(-6, -4)$
Focus: $\left(-6, -\dfrac{47}{12}\right)$

10) Parabola
Vertex: $(-3, 2)$
Focus: $\left(-3, \dfrac{7}{4}\right)$

11) Ellipse
Center: $(3, 0)$
Vertices: $(3, 7)$, $(3, -7)$
Foci: $(3, 4\sqrt{3})$, $(3, -4\sqrt{3})$

12) Hyperbola
Center: $(1, 0)$
Vertices: $(4, 0)$, $(-2, 0)$
Foci: $(1 + \sqrt{34}, 0)$, $(1 - \sqrt{34}, 0)$

13) Ellipse
Center: $(0, -4)$
Vertices: $(4, -4)$, $(-4, -4)$
Foci: $(\sqrt{7}, -4)$, $(-\sqrt{7}, -4)$

14) Hyperbola
Center: $(1, 0)$
Vertices: $(1 + \sqrt{15}, 0)$, $(1 - \sqrt{15}, 0)$
Foci: $(1 + 2\sqrt{10}, 0)$, $(1 - 2\sqrt{10}, 0)$

15) Hyperbola
Center: $(0, 0)$
Vertices: $(0, 5)$, $(0, -5)$
Foci: $(0, 2\sqrt{10})$, $(0, -2\sqrt{10})$

16) Circle
Center: $(-1, 2)$