Name _____ Date _____ Period _____

DIRECTIONS: For #1-2, respond in the provided blanks.

1. A parabola has its focus at $(8, -7)$ and directrix of $y = 1$. Identify the **vertex** of this parabola.

2. A parabola has its vertex at $(5, 3)$ and focus at $(1, 3)$. Identify the **directrix** of this parabola.

$(8, -3)$

$x = 9$

DIRECTIONS: For #3-4, **write equations** for the described parabolas in the provided blanks.

3. Focus $(-1, 7)$; Vertex $(-1, 3)$

4. Focus $(4, -4)$; Directrix $y = -6$

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

$y - 3 = \frac{1}{16}(x + 1)^2$

DIRECTIONS: For #5-6, **rewrite the equations** in the standard form for parabolas. Then identify the **vertex**, **focus**, **directrix**, and **axis of symmetry** for the parabola.

5. $x^2 - 8x + 2y + 16 = 0$

6. $y^2 + 8x + 2y - 15 = 0$

Equation:

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

Vertex: $(4, 0)$

Focus: $(4, -\frac{1}{2})$

Directrix: $y = \frac{1}{2}$

Axis: $x = 4$

Equation:

$x - 2 = -\frac{1}{8}(y + 1)^2$

Vertex: $(2, -1)$

Focus: $(0, -1)$

Directrix: $x = 4$

Axis: $y = -1$

<u>DIRECTIONS</u>: For #7, **write an equation** for an ellipse with the given intercepts.

7. *x*-intercepts: ± 9 ; y-intercepts: ± 2 $\dfrac{x^2}{81} + \dfrac{y^2}{4} = 1$

<u>DIRECTIONS</u>: For #8-9, **write equations** for ellipses with the given foci and sum of focal radii.

8. Foci: $(-1,3),(3,3)$;
   Sum of focal radii $= 10$

9. Foci: $(-6,0),(6,0)$;
   Sum of focal radii $= 14$

$\dfrac{(x-1)^2}{25} + \dfrac{(y-3)^2}{21} = 1$ $\dfrac{x^2}{49} + \dfrac{y^2}{13} = 1$

<u>DIRECTIONS</u>: For #10-11, **rewrite the equations** in the standard form for ellipses. Then identify the **center**, direction of the **major axis** (horizontal or vertical), **verticies**, **co-verticies**, and **foci**.

10. $x^2 + 9y^2 - 36y + 27 = 0$ **11.** $9x^2 + 4y^2 - 36x + 8y + 4 = 0$

Equation:

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

Center: $(0,2)$

Major axis: HORIZONTAL

Verticies: $(3,2),(-3,2)$

Co-verticies: $(0,3),(0,1)$

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

Equation:

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

Center: $(2,-1)$

Major axis: VERTICAL

Verticies: $(2,2),(2,-4)$

Co-verticies: $(4,-1),(0,-1)$

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