Name ____ Date ______________________ Period ________

DIRECTIONS: For #1, find the **distance** between the given points and the **midpoint** of the segment defined by the points.

1. $(2, -3), (8, -5)$ Distance ____________________ Midpoint _____________

DIRECTIONS: For #2, find the **coordinates of *Z*** given that M is the midpoint of $\overline{YZ}$.

2. $Y(5, 1), M(-2, 4)$ Z ____________

DIRECTIONS: For #3, write an **equation** of the circle (in standard form) with the given center and radius.

3. $(3, -7)$; radius $= 5$ ____

DIRECTIONS: For #4, write the following **equation** in the standard form of a circle, then identify the **center** and the **radius**.

4. $x^2 + y^2 + 6x - 8y - 39 = 0$ Equation __________________________

Center ____________ Radius ________

DIRECTIONS: For #5-6, respond in the provided blanks.

5. A parabola has its vertex at $(-4, 2)$ and directrix of $y = 5$. Identify the **focus** of this parabola.

____

6. A parabola has its vertex at $(5, -1)$ and focus at $(9, -1)$. Identify the **directrix** of this parabola.

____

DIRECTIONS: For #7, **rewrite the equations** in the standard form for parabolas. Then identify the **vertex**, **focus**, **directrix**, and **axis of symmetry** for the parabola.

7. $y^2 + 12x - 10y + 37 = 0$

Equation ______________________________

Vertex __________ Focus __________

Directrix _________ Axis __________

DIRECTIONS: For #8, **write an equation** for an ellipse with the given intercepts.

8. *x*-intercepts: ± 8 ; y-intercepts: ± 7 ________________________________

DIRECTIONS: For #9, **write an equation** for an ellipse with the given foci and sum of focal radii.

9. Foci: $(2, 1), (2, 7)$; sum of focal radii $= 8$ ________________________________

DIRECTIONS: For #10, **rewrite the equation** in the standard form for ellipses. Then identify the **center**, direction of the **major axis**, **verticies**, **co-verticies**, and **foci**.

10. $4x^2 + 25y^2 + 16x - 150y + 141 = 0$

Equation ______________________________

Center __________ Major axis __________

Verticies _________________________

Co-verticies _________________________

Foci _________________________

DIRECTIONS: For #11-12, use the given information to **write an equation** for a hyperbola.

11. Foci: $(6, 0), (-6, 0)$; difference of focal radii $= 10$ ________________________________

12. Foci: $(1, 1), (1, 7)$; slope of asymptotes $= \pm\frac{\sqrt{5}}{2}$ ________________________________

DIRECTIONS: For #13, **rewrite the equation** in the standard form for hyperbolas. Then identify the **center**, direction of the **transverse axis**, **verticies**, **foci**, and the **slopes of the asymptotes**.

13. $x^2 - 4y^2 + 10x + 32y - 55 = 0$

Equation ________________________________

Center _______ Transverse axis ____________

Verticies __________________________

Foci __________________________

Slopes of asymptotes ___________________

DIRECTIONS: For #14-17, **identify the conic section** (circle, ellipse, parabola, hyperbola) from its equation.

14. $2x^2 + 2y^2 - 20x + 4y - 34 = 0$

____

16. $2x^2 - 3y^2 - 12x - 18y - 15 = 0$

____

15. $2x^2 - 4x - y - 5 = 0$

____

17. $4x^2 + 5y^2 + 16x - 60y + 176 = 0$

____

EQUATION SHEET (a list of equations, with no explanations or labels) – you will also get graph paper to use during the test

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

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

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

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

$$a = \frac{1}{4c}$$

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

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

$$c^2 = a^2 - b^2$$

$$c^2 = a^2 + b^2$$

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

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