DIRECTIONS: For #1-2, identify the equation (#2 only), center, direction of the transverse axis, vertices, foci, and slopes of asymptotes for the following hyperbolas. Use the provided grids to graph the hyperbolas (use a straightedge for the asymptotes).

1. \( \frac{y^2}{36} - \frac{x^2}{25} = 1 \)

   Center \((0, 0)\)    Transverse axis \ VERTICAL

   Verticies \((0, 6), (0, -6)\) or \((0, \pm 6)\)

   Foci \((0, \sqrt{61}), (0, -\sqrt{61})\) or \((0, \pm \sqrt{61})\)

   Slope of asymptotes \(\pm \frac{6}{5}\)

[Notice that this graph counts by twos]
2. \[ 25y^2 - 4x^2 + 100 = 0 \]

Equation \[ \frac{x^2}{25} - \frac{y^2}{4} = 1 \]

Center \((0, 0)\)  Transverse axis \ HORIZONTAL

Verticies \((5, 0), (-5, 0)\) or \((\pm 5, 0)\)

Foci \((\sqrt{29}, 0), (-\sqrt{29}, 0)\) or \((\pm \sqrt{29}, 0)\)

Slope of asymptotes \(\pm \frac{2}{5}\)
DIRECTIONS: For #3-4, write equations for the described hyperbolas in the provided blanks. Graph grids are provided for your convenience - you are not required to use them.

3. Foci: $(-3, 0), (3, 0)$
   Difference of focal radii: 4

\[
\frac{x^2}{4} - \frac{y^2}{5} = 1
\]

4. Foci: $(2, 4), (-4, 4)$
   Difference of focal radii: 2

\[
\frac{(x + 1)^2}{1} - \frac{(y - 4)^2}{8} = 1
\]
DIRECTIONS: For #5, determine the center and foci of the hyperbola described by the equation. A graph grid is provided for your convenience - you are not required to use it.

\[ \frac{(x+2)^2}{25} - \frac{(y-3)^2}{11} = 1 \]

Center \((-2, 3)\)  Foci \((-8, 3), (4, 3)\)

DIRECTIONS: For #6-9, identify the conic sections (circle, ellipse, hyperbola, parabola) from their equations.

6. \(9x^2 - 4y^2 + 36x - 24y - 36 = 0\)  hyperbola

8. \(y^2 - 2y - 4x + 9 = 0\)  parabola

7. \(9x^2 + 4y^2 + 36x - 24y - 36 = 0\)  ellipse

9. \(2x^2 + 2y^2 + 8x + 12y + 8 = 0\)  circle