Essential Question

How do I write the equation of a circle or ellipse in rectangular form?
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**Standard Form of a Circle**

\[(x - h)^2 + (y - k)^2 = r^2\]

center \((h, k)\)

**Standard Form of an Ellipse**

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

center \((h, k)\)

\(a\rightarrow x\text{-axis radius}\)

\(b\rightarrow y\text{-axis radius}\)
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Graph the equation and label the center and radius.

1. \[ x^2 + y^2 - 169 = 0 \]
   - \( x^2 + y^2 = 169 \)
   - Center: \((0, 0)\)
   - Radius: \(\sqrt{169} = 13\)

2. \[ (x + 3)^2 + (y - 1)^2 = 81 \]
   - Center: \((-3, 1)\)
   - Radius: \(9\)
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Graph the equation, state the center, and state the vertices for the figure.

3. \( \frac{x^2}{25} + \frac{y^2}{4} = 1 \)
   - Center: \((0,0)\)
   - \(a = 5\) \(b = 2\)
   - Vertices: \((\pm 5, 0)\) \((0, \pm 2)\)

4. \( \frac{(x+1)^2}{1} + \frac{(y+6)^2}{36} = 1 \)
   - Center: \((-1, -6)\)
   - \(a = 1\) \(b = 6\)
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Write the equation for the graphs below.

5. (x+1)^2 + (y+2)^2 = 25

6. \( \frac{(x+2)^2}{9} + \frac{(y-1)^2}{1} = 1 \)