

Ellipse WS

Name:

1. What is the equation of the ellipse whose center is at $(-1,3)$ with the horizontal major axis of 6 and the vertical minor axis of 4?
2. What is the center of the ellipse $9x^2 + 36x + 25y^2 - 50y = 164$?
3. What is the size of the major axis of the ellipse $9x^2 + 36x + 25y^2 - 50y = 164$?
4. What are the foci of the ellipse $9x^2 + 36x + 25y^2 - 50y = 164$?
5. What is the equation of the ellipse centered at $(5,-1)$ with a major horizontal axis that measures 10 across?
6. Graph the ellipse $\frac{(x-1)^2}{4} + \frac{(y-2)^2}{25} = 1$

1. What is the equation of the ellipse whose center is at $(-1,3)$ with the horizontal major axis of 6 and the vertical minor axis of 4?

$$\frac{(x+1)^2}{9} + \frac{(y-3)^2}{4} = 1$$

2. What is the center of the ellipse $9x^2 + 36x + 25y^2 - 50y = 164$?

Factor and Complete the square to get into standard form

$$\begin{aligned} 9(x^2 + 4x) + 25(y^2 - 2y) &= 164 \\ 9(x+2)^2 + 25(y-1)^2 &= 164 + 9(4) + 25(1) \\ 9(x+2)^2 + 25(y-1)^2 &= 225 \\ \frac{(x+2)^2}{25} + \frac{(y-1)^2}{9} &= 1 \end{aligned}$$

So the center is $(-2,1)$

3. What is the size of the major axis of the ellipse $9x^2 + 36x + 25y^2 - 50y = 164$?

Using the standard form from question 1, the horizontal axis goes $\sqrt{5} = 5$ to the left and right of the center, so the axis is 10 across.

4. What are the foci of the ellipse $9x^2 + 36x + 25y^2 - 50y = 164$?
Since $c = \sqrt{25 - 9} = 4$, the foci are $(-2 \pm 4, 1)$ or $(-6, 1)$ and $(2, 1)$.

5. What is the equation of the ellipse centered at $(5,-1)$ with a major horizontal axis that measures 10 across?

$$\frac{(x-5)^2}{25} + \frac{(y+1)^2}{b} = 1$$

where b is any number such that $1 \leq b < 25$ (so that the vertical axis is the minor axis).

6. Graph the ellipse $\frac{(x-1)^2}{4} + \frac{(y-2)^2}{25} = 1$.

