# 11.1 Circles & Ellipses

## Essential Question

How do I write the equation of a circle
or ellipse in rectangular form?

# 11.1 Circles & Ellipses

**Essential Question** How do I write the equation of a circle or ellipse in rectangular form?

## Standard Form of a Circle

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

center $(h, k)$

radius $r$

## Standard Form of an Ellipse

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

center $(h, k)$

$a \rightarrow$ x-axis radius
$b \rightarrow$ y-axis radius

# 11.1 Circles & Ellipses

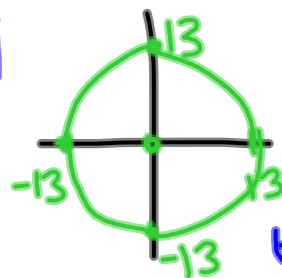**Essential Question** How do I write the equation of a circle or ellipse in rectangular form?

Graph the equation and label the center and radius.
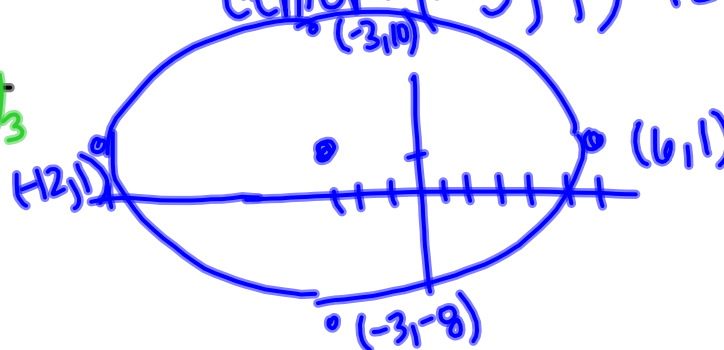
1.  $x^2 + y^2 - 169 = 0$

$x^2 + y^2 = 169$

center : $(0,0)$
radius: $\sqrt{169} = 13$

2.  $(x+3)^2 + (y-1)^2 = 81$
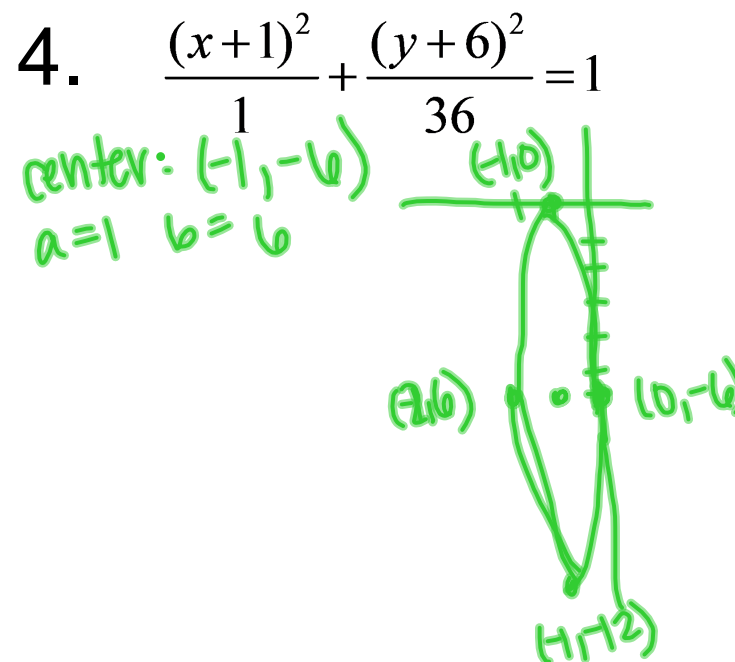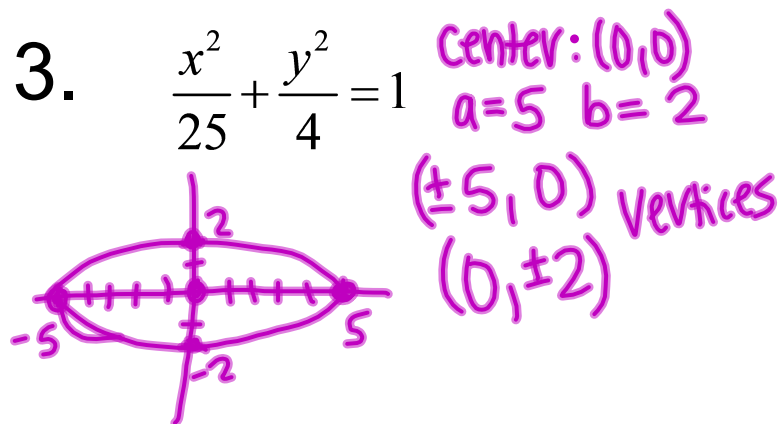
center : $(-3, 1)$ radius: $9$

$(-3,10)$

$(-12,1)$

$(6,1)$

$(-3,-8)$

# 11.1 Circles & Ellipses

**Essential Question** How do I write the equation of a circle or ellipse in rectangular form?

Graph the equation, state the center, and state the vertices for the figure.

3.　　$\dfrac{x^2}{25} + \dfrac{y^2}{4} = 1$

Center: $(0,0)$
$a = 5 \quad b = 2$
$(\pm 5, 0)$ vertices
$(0, \pm 2)$

4.　　$\dfrac{(x+1)^2}{1} + \dfrac{(y+6)^2}{36} = 1$

center: $(-1, -6)$
$a = 1 \quad b = 6$

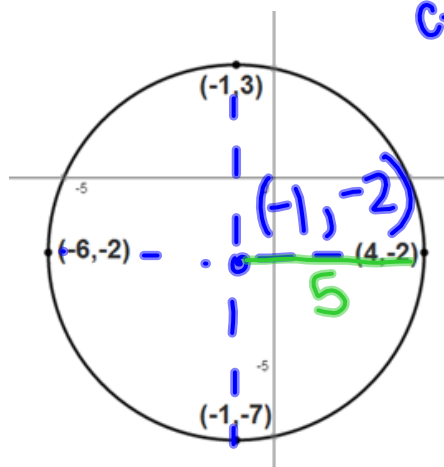$(-1,0)$
$(-2,6)$ 　 $(0,-6)$
$(-1,-12)$

# 11.1 Circles & Ellipses

**Essential Question** How do I write the equation of a circle or ellipse in rectangular form?
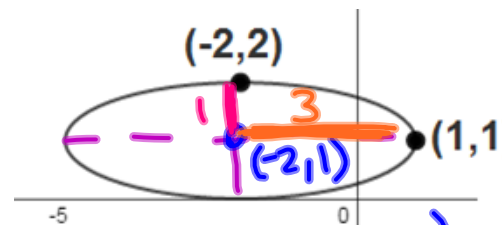
Write the equation for the graphs below.

center is midpoint of both diameters

**5.**

(-1,3)

(-6,-2)　(4,-2)

(-1,-2)

5

(-1,-7)

center (-1,-2)
radius 5

$$(x+1)^2 + (y+2)^2 = 25$$

**6.**

(-2,2)

3

(1,1)

(-2,1)

center (-2,1)

(x-axis) $a = 3$　$b = 1$
(y-axis)

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