

Name: _____
PCH Ellipses

Date: _____
Ms. Loughran

Do Now:

Sketch the graph of each ellipse. State the coordinates of the center, vertices, covertices, and foci. State the length of the major axis and the length of the minor axis.

$$1. \quad \frac{25(x+2)^2}{225} + \frac{9y^2}{225} = \frac{225}{225}$$

$$\frac{(x+2)^2}{9} + \frac{y^2}{25} = 1$$

center: $(-2, 0)$

VMA

$$a = 5 \uparrow \downarrow$$

$$b = 3 \leftarrow \rightarrow$$

vertices: $(-2, \pm 5)$

covertices: $(1, 0), (-5, 0)$

foci: $(-2, \pm 4)$

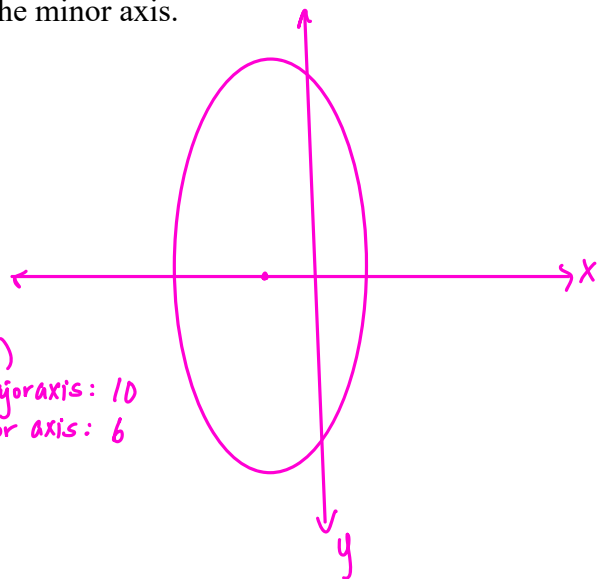
length of major axis: 10

length of minor axis: 6

$$c^2 = 25 - 9$$

$$c^2 = 16$$

$$c = 4 \uparrow \downarrow$$



For #s 1–6, write the standard form equation of an ellipse having the given properties.

1. Center $(0, 0)$; horizontal major axis of length 10; minor axis of length 6.

$$a = 5$$

$$b = 3$$

$$\frac{x^2}{25} + \frac{y^2}{9} = 1$$

2. Center $(0, 0)$; foci $(\pm 2, 0)$; vertices $(\pm 5, 0)$

$$a = 5$$

$$c = 2$$

$$\frac{x^2}{25} + \frac{y^2}{21} = 1$$

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

$$4 = 25 - b^2$$

$$-21 = -b^2$$

$$21 = b^2$$

$$b = \sqrt{21}$$

3. Vertices $(0, \pm 5)$; foci $(0, \pm 3)$

VMA $c: (0, 0)$

$$a = 5$$

$$c = 3$$

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

$$9 = 25 - b^2$$

$$-16 = -b^2$$

$$16 = b^2$$

$$b = 4$$

$$\frac{x^2}{16} + \frac{y^2}{25} = 1$$

Homework 02-29

Identify the center, vertices, co-vertices, foci, length of the major axis, and length of the minor axis of each.

1) $\frac{x^2}{49} + \frac{y^2}{169} = 1$

Center: (0, 0)
Vertices: (0, 13), (0, -13)
Co-vertices: (7, 0), (-7, 0)
Foci: (0, $2\sqrt{30}$), (0, $-2\sqrt{30}$)
Major Axis: 26 units
Minor Axis: 14 units

2) $\frac{x^2}{36} + \frac{y^2}{16} = 1$

Center: (0, 0)
Vertices: (6, 0), (-6, 0)
Co-vertices: (0, 4), (0, -4)
Foci: ($2\sqrt{5}$, 0), ($-2\sqrt{5}$, 0)
Major Axis: 12 units
Minor Axis: 8 units

3) $\frac{x^2}{95} + \frac{y^2}{30} = 1$

Center: (0, 0)
Vertices: ($\sqrt{95}$, 0), ($-\sqrt{95}$, 0)
Co-vertices: (0, $\sqrt{30}$), (0, $-\sqrt{30}$)
Foci: ($\sqrt{65}$, 0), ($-\sqrt{65}$, 0)
Major Axis: $2\sqrt{95}$ units
Minor Axis: $2\sqrt{30}$ units

4) $\frac{x^2}{169} + \frac{y^2}{64} = 1$

Center: (0, 0)
Vertices: (13, 0), (-13, 0)
Co-vertices: (0, 8), (0, -8)
Foci: ($\sqrt{105}$, 0), ($-\sqrt{105}$, 0)
Major Axis: 26 units
Minor Axis: 16 units

5) $\frac{x^2}{64} + \frac{(y-6)^2}{121} = 1$

Center: (0, 6)
Vertices: (0, 17), (0, -5)
Co-vertices: (8, 6), (-8, 6)
Foci: (0, $6 + \sqrt{57}$), (0, $6 - \sqrt{57}$)
Major Axis: 22 units
Minor Axis: 16 units

6) $\frac{(x+5)^2}{81} + \frac{(y-1)^2}{144} = 1$

Center: (-5, 1)
Vertices: (-5, 13), (-5, -11)
Co-vertices: (4, 1), (-14, 1)
Foci: ($-5, 1 + 3\sqrt{7}$), ($-5, 1 - 3\sqrt{7}$)
Major Axis: 24 units
Minor Axis: 18 units

$$7) \frac{(x-3)^2}{49} + \frac{(y-9)^2}{4} = 1$$

Center: (3, 9)

Vertices: (10, 9), (-4, 9)

Co-vertices: (3, 11), (3, 7)

Foci: $(3 + 3\sqrt{5}, 9)$, $(3 - 3\sqrt{5}, 9)$

Major Axis: 14 units

Minor Axis: 4 units

$$8) \frac{x^2}{64} + \frac{(y-8)^2}{9} = 1$$

Center: (0, 8)

Vertices: (8, 8), (-8, 8)

Co-vertices: (0, 11), (0, 5)

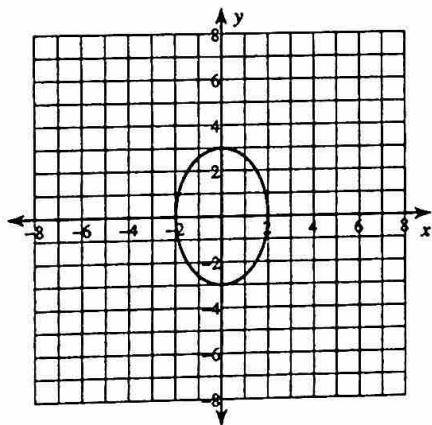
Foci: $(\sqrt{55}, 8)$, $(-\sqrt{55}, 8)$

Major Axis: 16 units

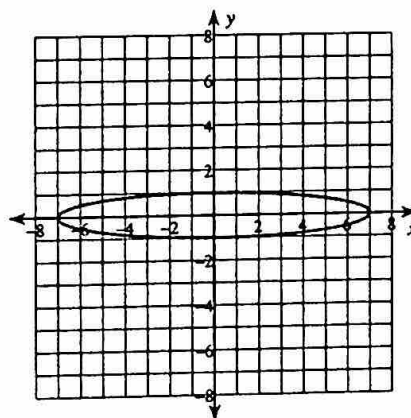
Minor Axis: 6 units

Graph each equation.

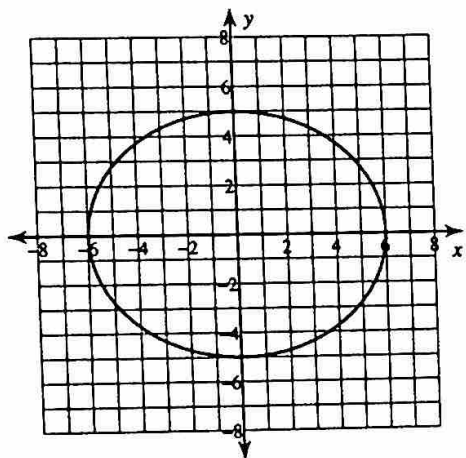
$$9) \frac{x^2}{4} + \frac{y^2}{9} = 1$$



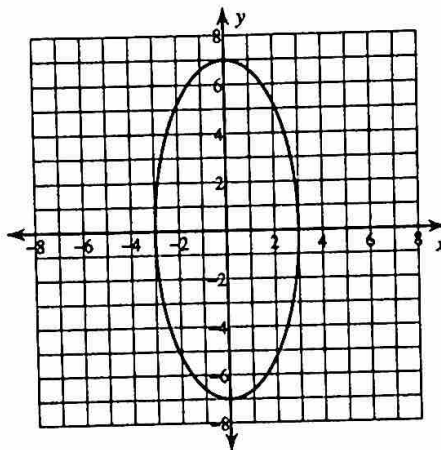
$$10) \frac{x^2}{49} + y^2 = 1$$



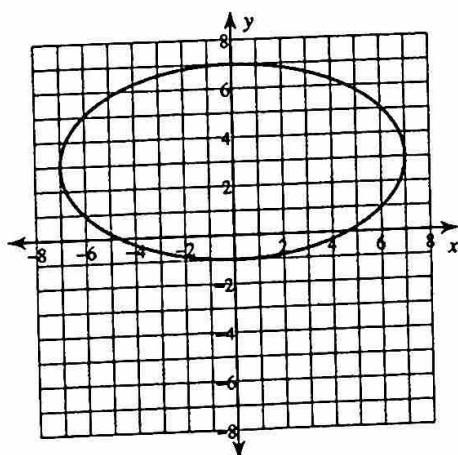
$$11) \frac{x^2}{36} + \frac{y^2}{25} = 1$$



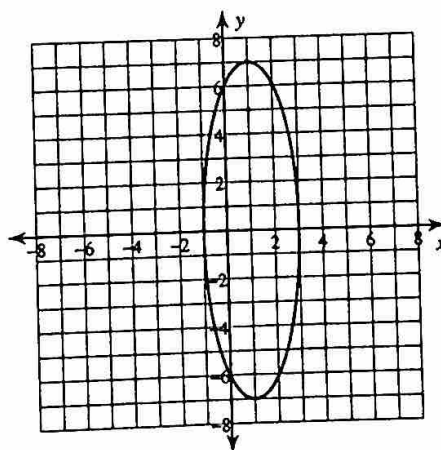
$$12) \frac{x^2}{9} + \frac{y^2}{49} = 1$$



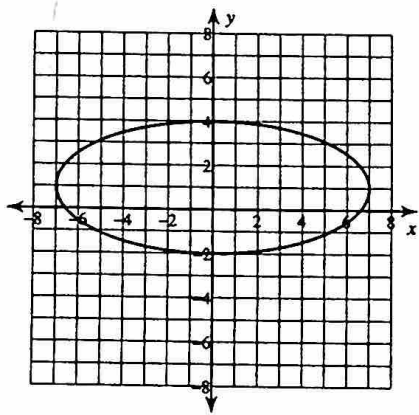
$$13) \frac{x^2}{49} + \frac{(y-3)^2}{16} = 1$$



$$14) \frac{(x-1)^2}{4} + \frac{y^2}{49} = 1$$



$$15) \frac{x^2}{49} + \frac{(y-1)^2}{9} = 1$$



$$16) (x+5)^2 + \frac{y^2}{49} = 1$$

