#11 Classwork Ellipse Name_____

Sketch a graph, find the indicated parts and Write the equation in standard form for each ellipse. center (0,0).

1. Vertex $(-9,0)$, co-vertex $(0,7)$

$x=-9$ $x^2=81$ $y=7$ $y^2=49$

Foci: ($\pm\sqrt{32}$, 0)&

($\sqrt{32}$, 0)

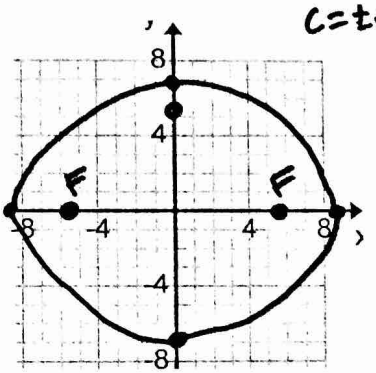
Equation: $\frac{x^2}{81}+\frac{y^2}{49}=1$

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

$=81-49=32$

$\sqrt{c^2}=\pm\sqrt{32}$

$c=\pm\sqrt{32}$



2. Vertex $(0,25)$, focus $(0,-20)$

$c^2=400$

Co-vertices: (15 , 0)&

(-15 , 0)

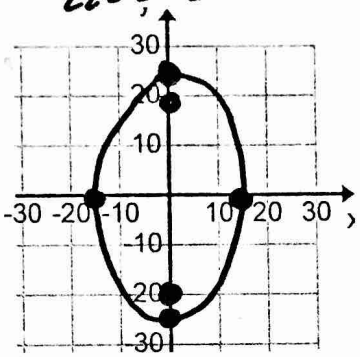
Equation: $\frac{x^2}{225}+\frac{y^2}{625}=1$

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

$400=625-b^2$

$-625 \quad -625$

$-225=-b^2$ $b^2=225$



3. co-vertex $(10,0)$, focus $(0,24)$

$x^2=100$ $c=24$ $c^2=576$

vertices: (0 , 26)&

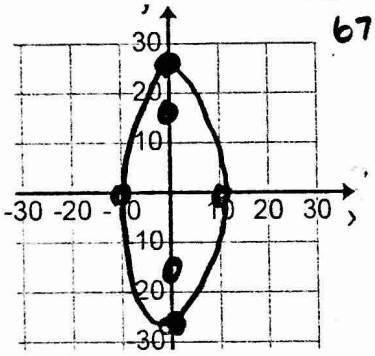
(0 , -26)

Equation: $\frac{x^2}{100}+\frac{y^2}{676}=1$

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

$576=a^2-100$

$676=a^2$

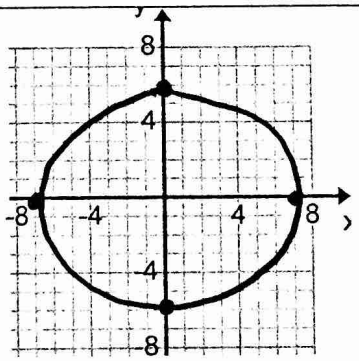


4. Vertex $(-7,0)$, focus $(\sqrt{13},0)$

Co-vertices: (0 , 6)&

(0 , -6)

Equation: $\frac{x^2}{49}+\frac{y^2}{36}=1$



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

$13=49-b^2$

$36=b^2$

Find the indicated parts and Graph each ellipse.

5. $\frac{x^2}{\sqrt{4}}+\frac{y^2}{\sqrt{25}}=1$

± 2 ± 5

Center: (0 , 0)&

vertices: (0 , 5)&

(0 , -5)

Co-vertices: (2 , 0)&

(-2 , 0)

Foci: (0 , $\sqrt{21}$)&

(0 , $-\sqrt{21}$)

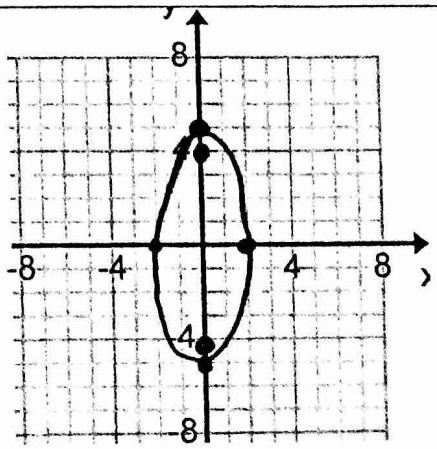
Domain: $-2 \le x \le 2$

Range: $-5 \le y \le 5$

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

$25-4=21$

$c=\pm\sqrt{21}$



6. $\frac{(x+2)^2}{\sqrt{36}} + \frac{y^2}{\sqrt{9}} = 1$

± 6 ± 3

Center: (-2 , 0)&

vertices: (4 , 0)&

(-8 , 0)

Co-vertices: (-2 , 3)&

(-2 , -3)

Foci: ($\sqrt{27}$, 0)&

($-\sqrt{27}$, 0)

Domain: $-8 \le x \le 4$

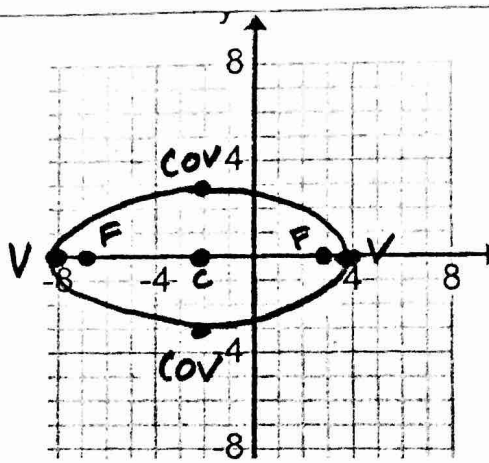
Range: $-3 \le y \le 3$

Foci

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

$c^2 = 36 - 9$

$c^2 = 27$ $c = \pm\sqrt{27}$



7. $\frac{(x+1)^2}{64} + \frac{(y-6)^2}{9} = 1$

Center: (-1 , 6)&

vertices: (+7 , 6)&

(-9 , 6)

Co-vertices: (-1 , 3)&

(-1 , 9)

Foci: ($-1+\sqrt{55}$, 6)&

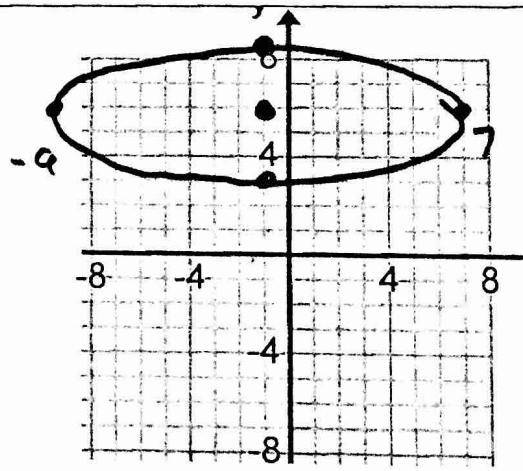
($-1-\sqrt{55}$, 6)

Domain: $-9 \le x \le 7$

Range: $3 \le y \le 9$

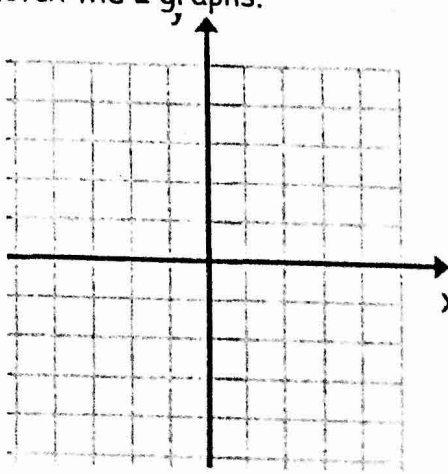
$c^2 = 64 - 9$

$c = \pm\sqrt{55}$



8. Engineers are building semi-elliptical bridges across two rivers. The larger river is 4 times as wide as the smaller river and must accommodate boats that are 3 times as tall. The equation for the bridge over the smaller river is $\frac{x^2}{225} + \frac{y^2}{144} = 1$, measured in feet.

A. Write the dimensions of the larger bridge.

B. Write an equation for the design of the larger bridge.

Sketch the 2 graphs.