

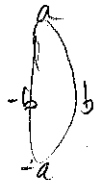
Ellipses - Graphing WS

Name Key

Graph each ellipse. Find the center, vertices, covertices, foci, and lengths of the major and minor axes for each ellipse whose equation is given.

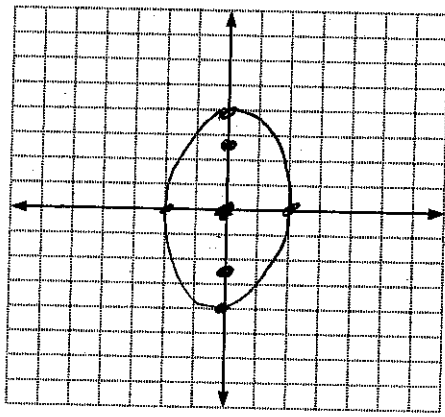
1.  $\frac{x^2}{4} + \frac{y^2}{16} = 1$

$a = 4$   
 $b = 2$



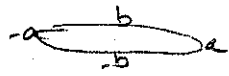
- C (0, 0)
- V (0, 4) (0, -4)
- CV (2, 0) (-2, 0)
- F (0, ±2√3)
- major length = 8
- minor length = 4

$c^2 = 16 - 4$   
 $c^2 = 12$   
 $c = ±\sqrt{12} = ±2\sqrt{3}$



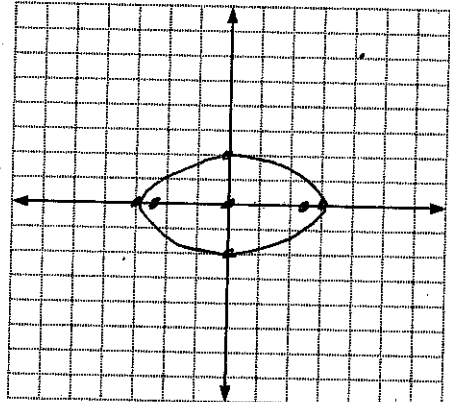
2.  $\frac{x^2}{9} + \frac{y^2}{4} = 1$

$a = 3$   
 $b = 2$



- C (0, 0)
- V (-3, 0) (3, 0)
- CV (0, 2) (0, -2)
- F (±√5, 0)
- major length = 6
- minor length = 4

$c^2 = 9 - 4$   
 $c^2 = 5$   $c = ±\sqrt{5}$



3.  $4x^2 + 81y^2 = 324$

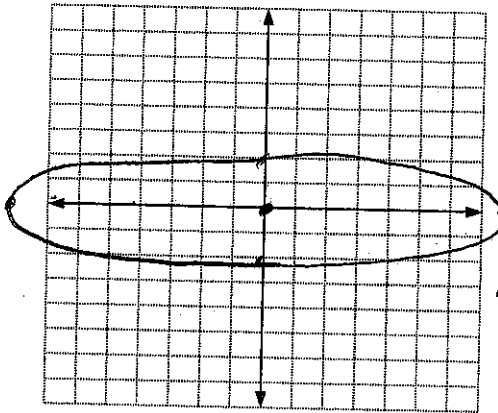
(hint: Divide the equation by 324.)

- C (0, 0)
- V (9, 0) (-9, 0)
- CV (0, 2) (0, -2)
- F (±√77, 0)

$a = 9$   
 $b = 2$

- major length = 18
- minor length = 4

$c^2 = 81 - 4$   
 $c^2 = 77$   $c = ±\sqrt{77}$



$\frac{4x^2}{324} + \frac{81y^2}{324} = \frac{324}{324}$

$\frac{x^2}{81} + \frac{y^2}{4} = 1$

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

$$C \underline{(2, -3)}$$

$$V \underline{(2, 0)} \quad \underline{(2, -6)}$$

$$CV \underline{(0, -3)} \quad \underline{(4, -3)}$$

$$F \underline{(2, -3 \pm \sqrt{5})}$$

$$\text{major length} = \underline{6}$$

$$\text{minor length} = \underline{4}$$

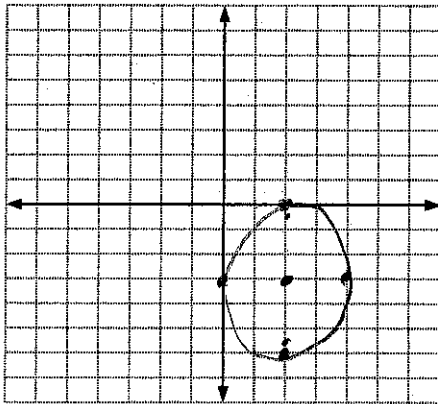
$$a=3$$

$$b=2$$

$$c^2 = 9 - 4$$

$$c^2 = 5$$

$$c = \pm\sqrt{5}$$



$$6. \frac{(x+2)^2}{a^2 4} + \frac{(y-4)^2}{b^2 1} = 1$$

$$C \underline{(-2, 4)}$$

$$V \underline{(0, 4)} \quad \underline{(-4, 4)}$$

$$CV \underline{(-2, 3)} \quad \underline{(-2, 5)}$$

$$F \underline{(-2 \pm \sqrt{3}, 4)}$$

$$\text{major length} = \underline{4}$$

$$\text{minor length} = \underline{2}$$

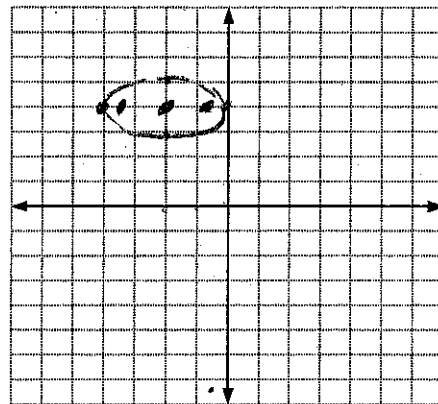
$$a=2$$

$$b=1$$

$$c^2 = 4 - 1$$

$$c^2 = 3$$

$$c = \pm\sqrt{3}$$



$$5. \frac{(x+4)^2}{25} + \frac{y^2}{16} = 1$$

$$C \underline{(-4, 0)}$$

$$V \underline{(1, 0)} \quad \underline{(-9, 0)}$$

$$CV \underline{(-4, 4)} \quad \underline{(-4, -4)}$$

$$F \underline{(-1, 0)} \quad \underline{(-7, 0)}$$

$$\text{major length} = \underline{10}$$

$$\text{minor length} = \underline{8}$$

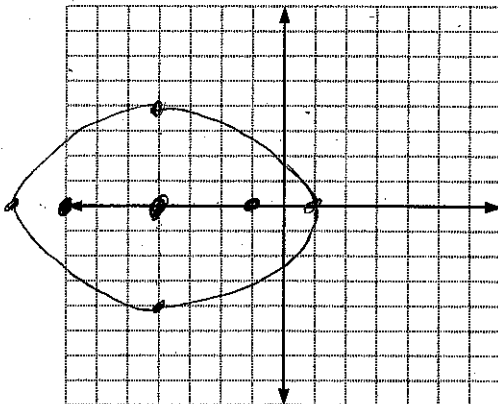
$$a=5$$

$$b=4$$

$$c^2 = 25 - 16$$

$$c^2 = 9$$

$$c = \pm 3$$



$$7. \frac{(x-3)^2}{25} + \frac{(y+3)^2}{36} = 1$$

$$C \underline{(3, -3)}$$

$$V \underline{(3, 3)} \quad \underline{(3, -9)}$$

$$CV \underline{(-2, -3)} \quad \underline{(8, -3)}$$

$$F \underline{(3, -3 \pm \sqrt{11})}$$

$$\text{major length} = \underline{12}$$

$$\text{minor length} = \underline{10}$$

$$a=6$$

$$b=5$$

$$c^2 = 36 - 25$$

$$c^2 = 11$$

$$c = \pm\sqrt{11}$$

