

Math 126: 8.3 Ellipse Homework

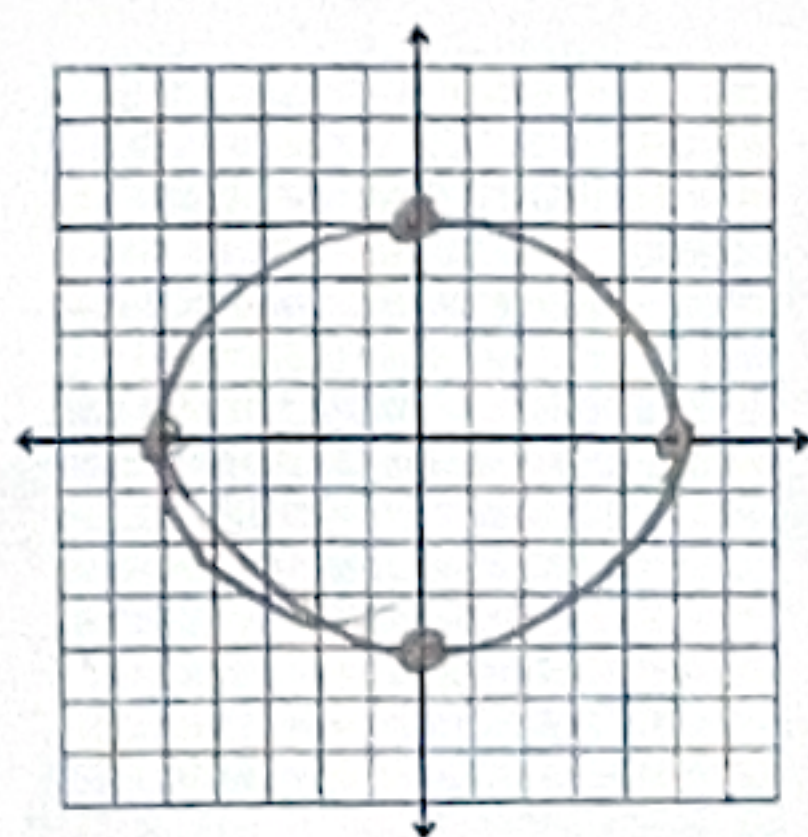
Name _____

8.3 Day 1: Complete the front of this worksheet and do MathXL 8.3 Day 1

8.3 Day 2: Complete the back of this worksheet and do MathXL 8.3 Day 2

#1-4: For each equation of an ellipse find the coordinates of the center and vertices and graph the ellipse.

1. $\frac{x^2}{25} + \frac{y^2}{16} = 1$
 $\swarrow \quad \searrow$
 $5^2 \quad 4^2$

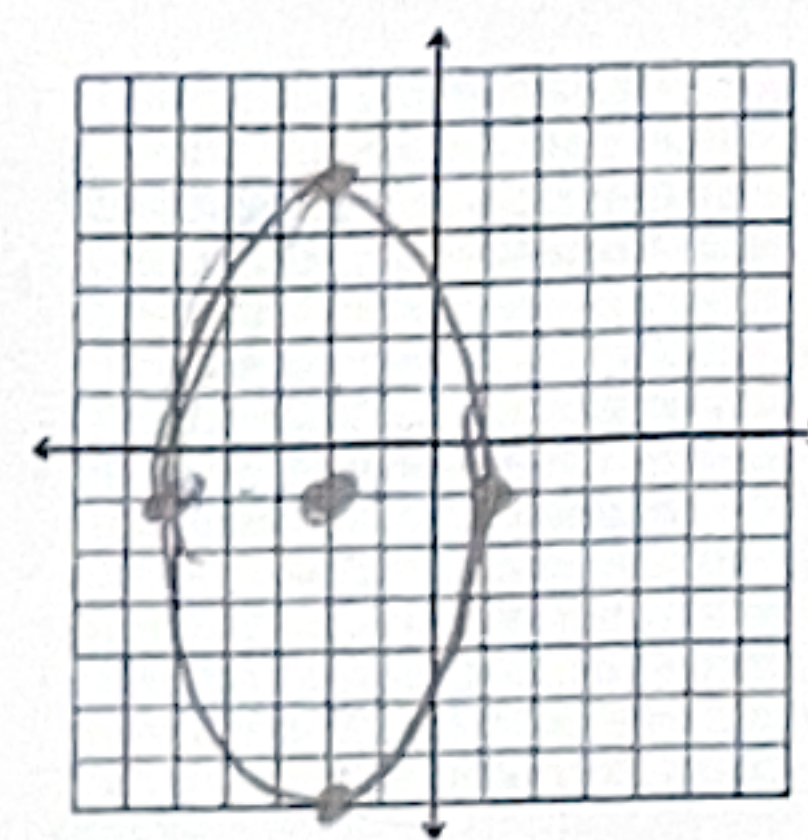


Center: $(0,0)$

Vertices: $(5,0)$ & $(-5,0)$

Co-vertices: $(0,4)$ & $(0,-4)$

2. $\frac{(x+2)^2}{9} + \frac{(y+1)^2}{36} = 1$
 $\swarrow \quad \nwarrow$
 $3^2 \quad 6^2$

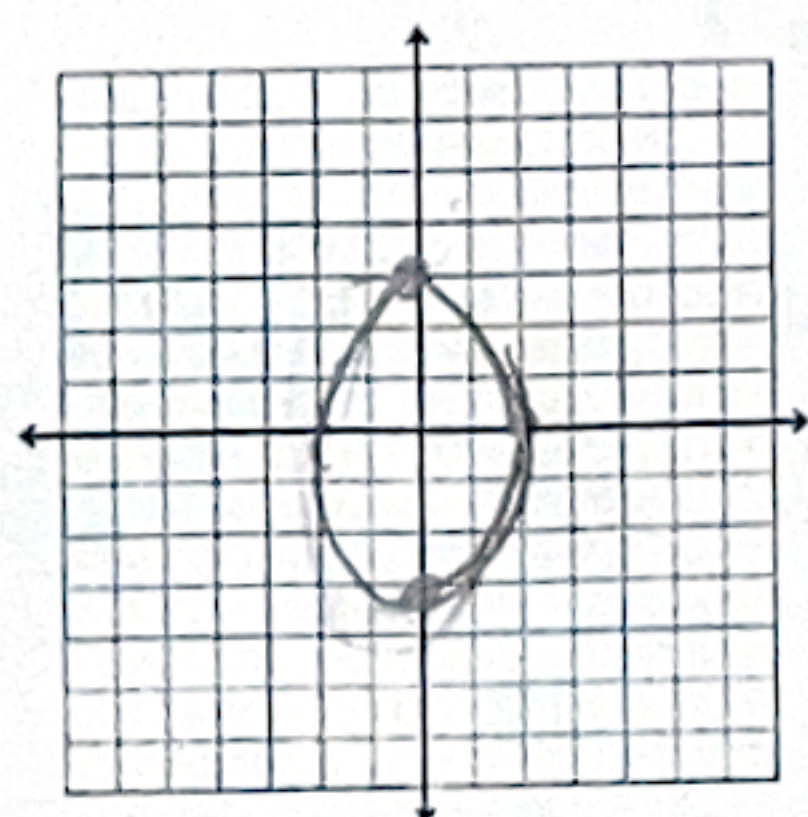


Center: $(-2,-1)$

Vertices: $(-2,5)$ & $(-2,-7)$

Co-vertices: $(-5,-1)$ & $(1,-1)$

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

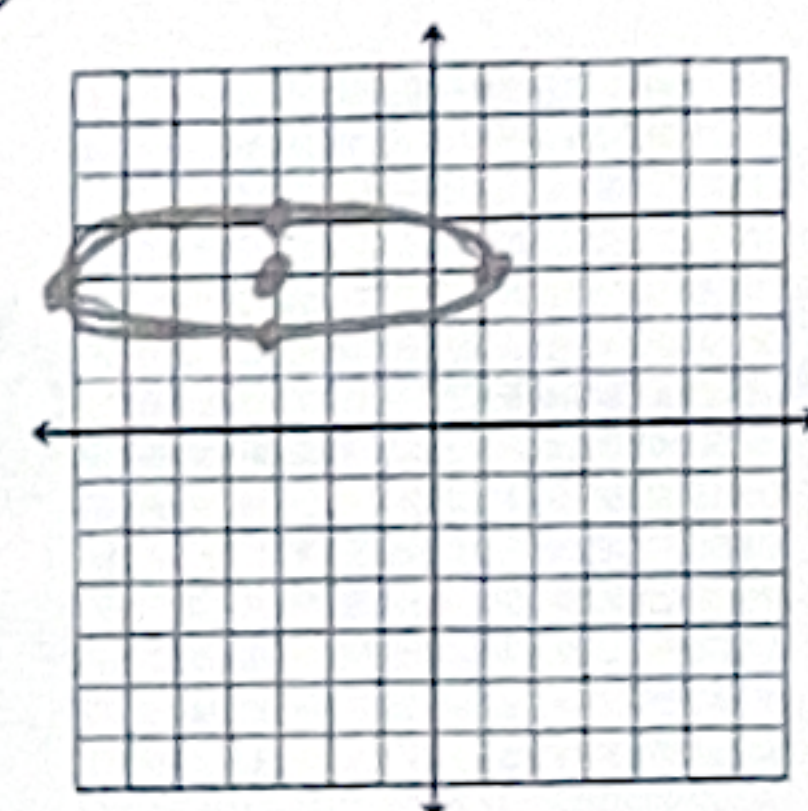


Center: $(0,0)$

Major axis vertices: $(0,3)$ & $(0,-3)$

Minor axis vertices: $(2,0)$ & $(-2,0)$

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



Center: $(-3,3)$

Major axis vertices: $(1,3)$ & $(-7,3)$

Minor axis vertices: $(-3,4)$ & $(-3,2)$

#5-6: Put each equation of an ellipse into standard form.

5. $3x^2 + y^2 + 18x - 2y + 4 = 0$

$\frac{(x+3)^2}{8} + \frac{(y-1)^2}{24} = 1$

6. $16x^2 + 25y^2 - 96x - 200y = -144$

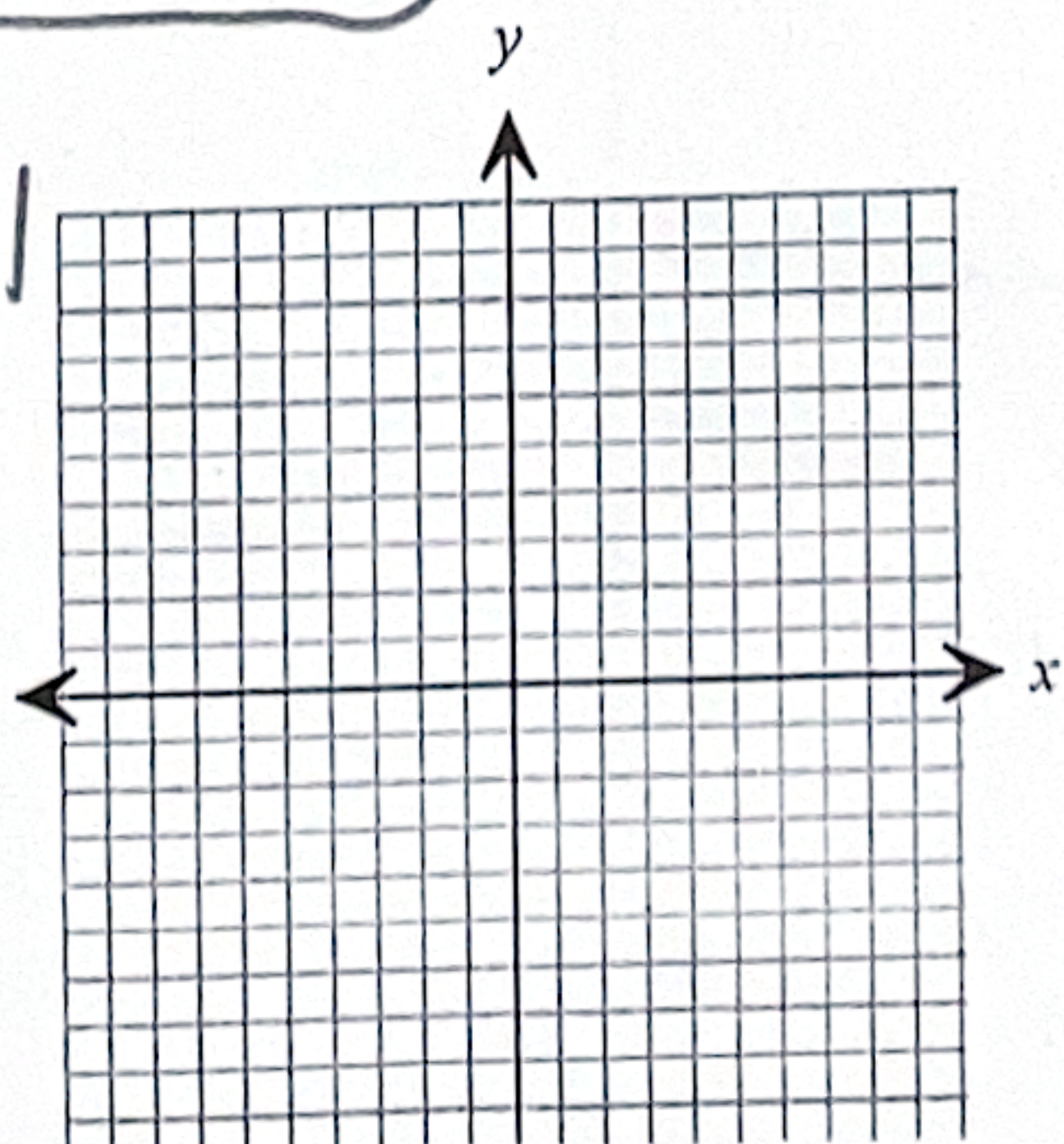
$\frac{(x-3)^2}{25} + \frac{(y-4)^2}{16} = 1$

#7-8: Write the equation of the ellipse that meets each set of conditions.

7. The center is $(-3, -1)$, the length of the horizontal semi-major axis is 7 units, and the length of the semi-minor axis is 5 units.

$a=7$
 $b=5$

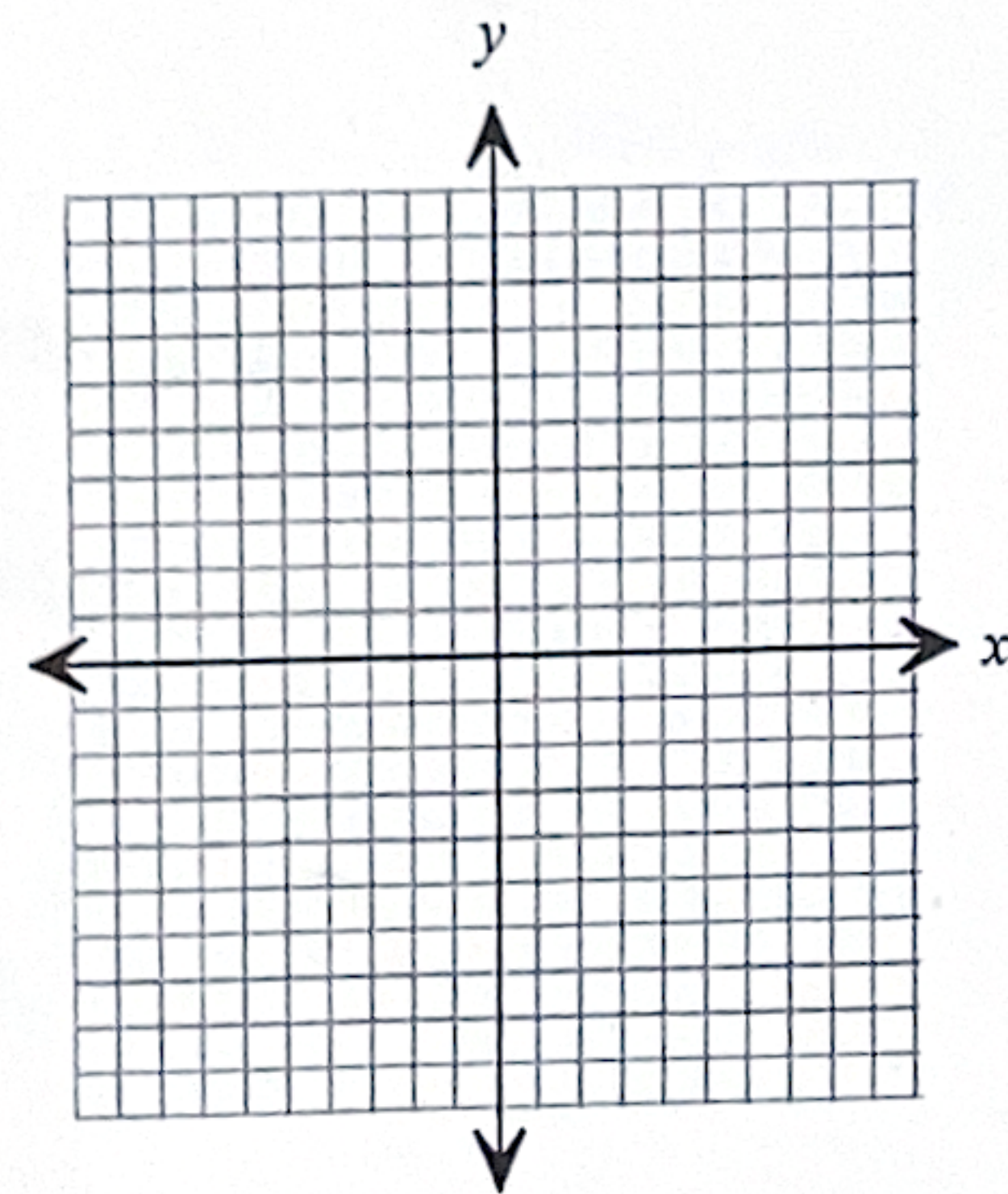
$\frac{(x+3)^2}{49} + \frac{(y+1)^2}{25} = 1$



8. The endpoints of the major axis are at $(-11, 5)$ and $(7, 5)$. The endpoints of the minor axis are at $(-2, 9)$ and $(-2, 1)$.

$2a=18 \Rightarrow a=9$

$\frac{(x+2)^2}{81} + \frac{(y-5)^2}{16} = 1$



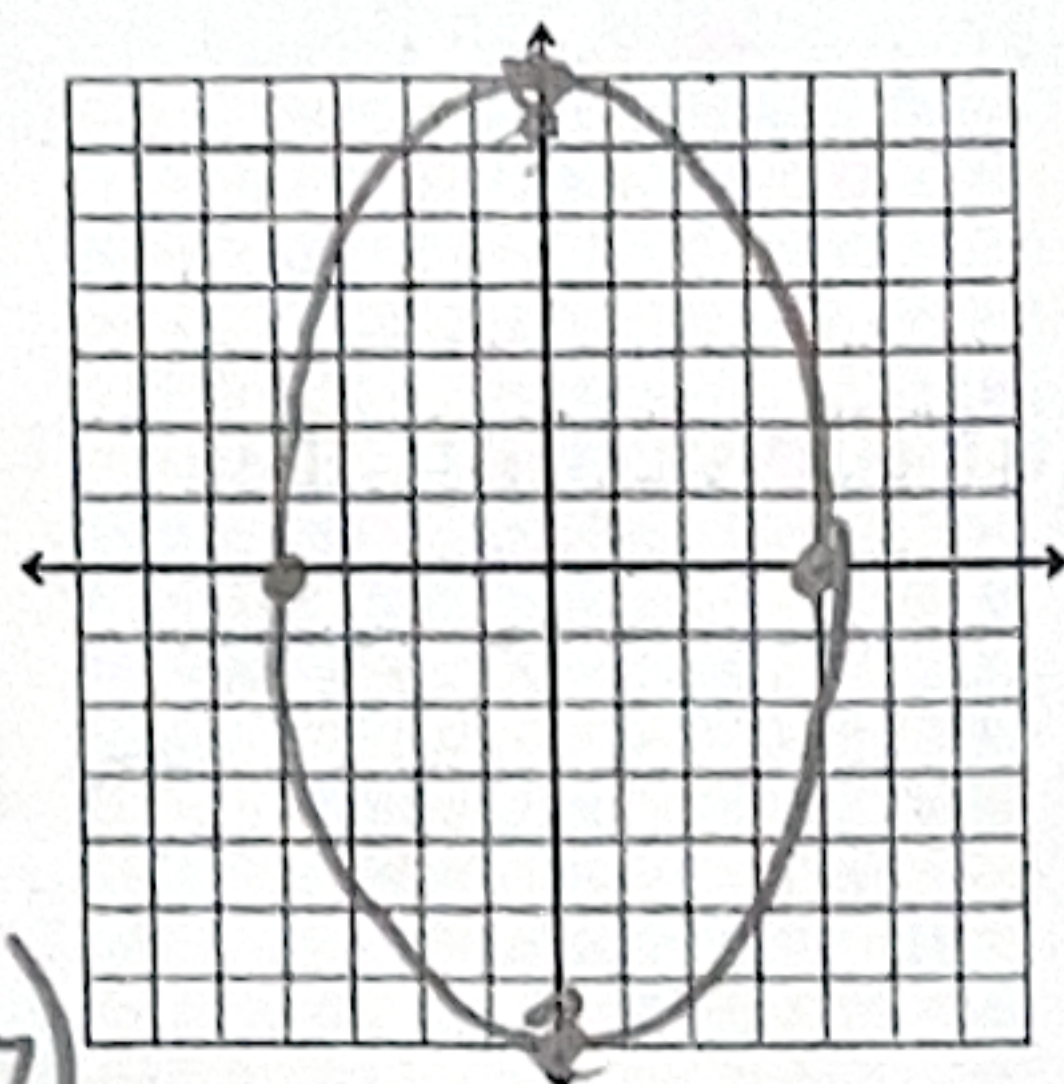
#9-12: For the equation of the ellipse, find the coordinates of the center and foci, and graph it.

9. $\frac{x^2}{16} + \frac{y^2}{49} = 1$

$c \approx \sqrt{33} \approx 5.7$

Center: $(0, 0)$

Foci: $(0, 5.7), (0, -5.7)$

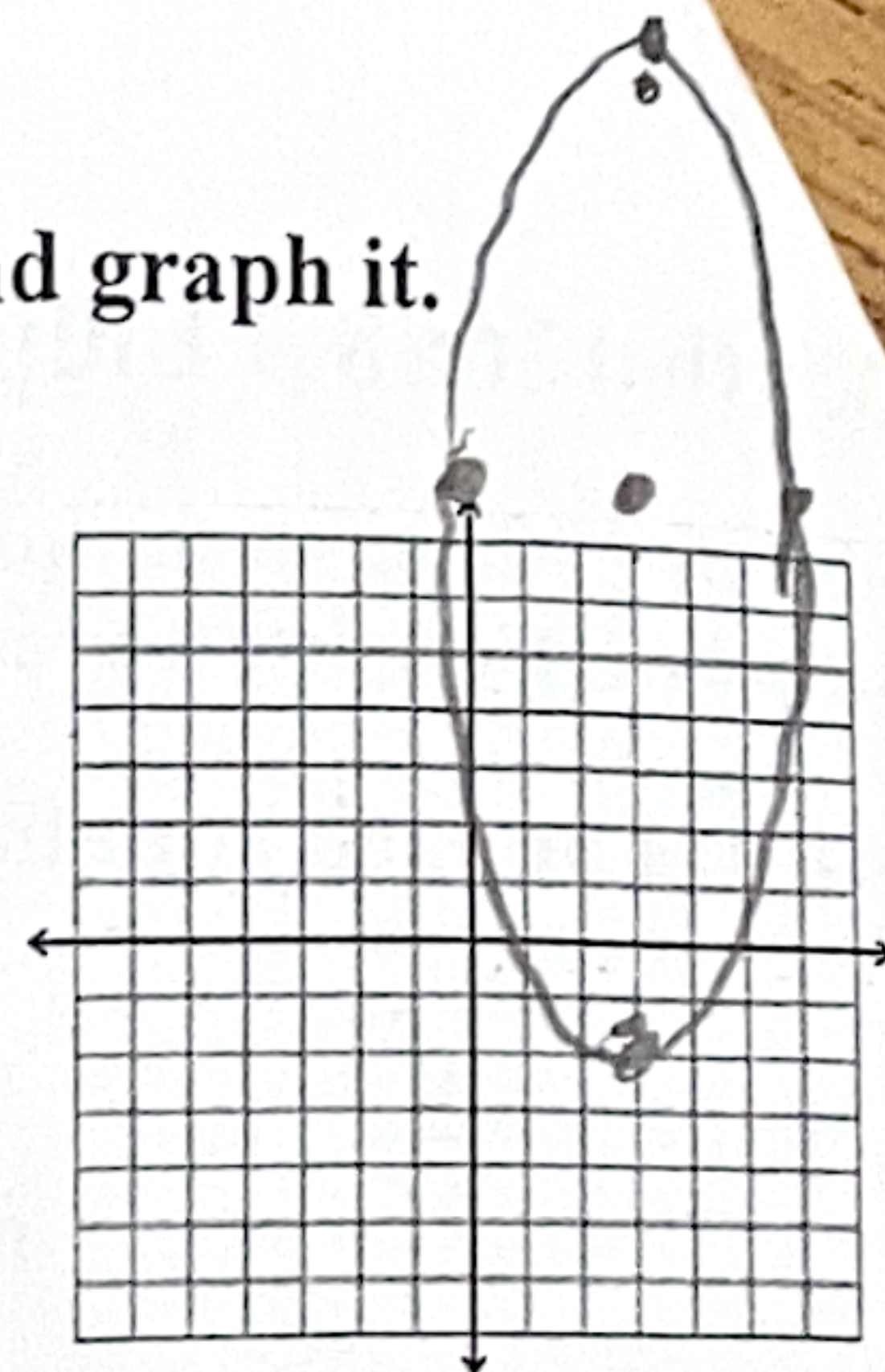


10. $\frac{(x-3)^2}{9} + \frac{(y-8)^2}{100} = 1$

$c = \sqrt{91} \approx 9.5$

Center: $(3, 8)$

Foci: $(3, 17.5), (3, -1.5)$

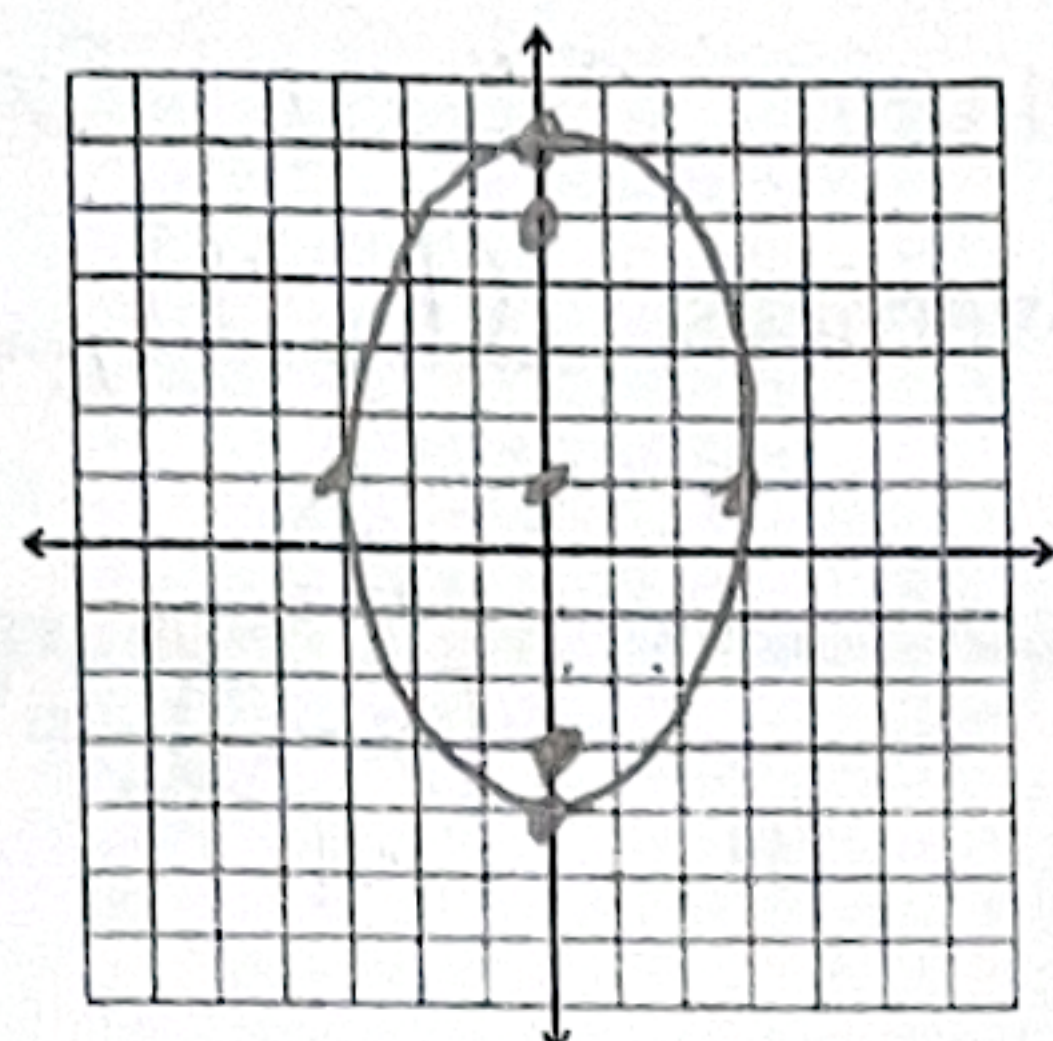


11. $\frac{x^2}{9} + \frac{(y-1)^2}{25} = 1$

$c = 4$

Center: $(0, 1)$

Foci: $(0, 5), (0, -3)$

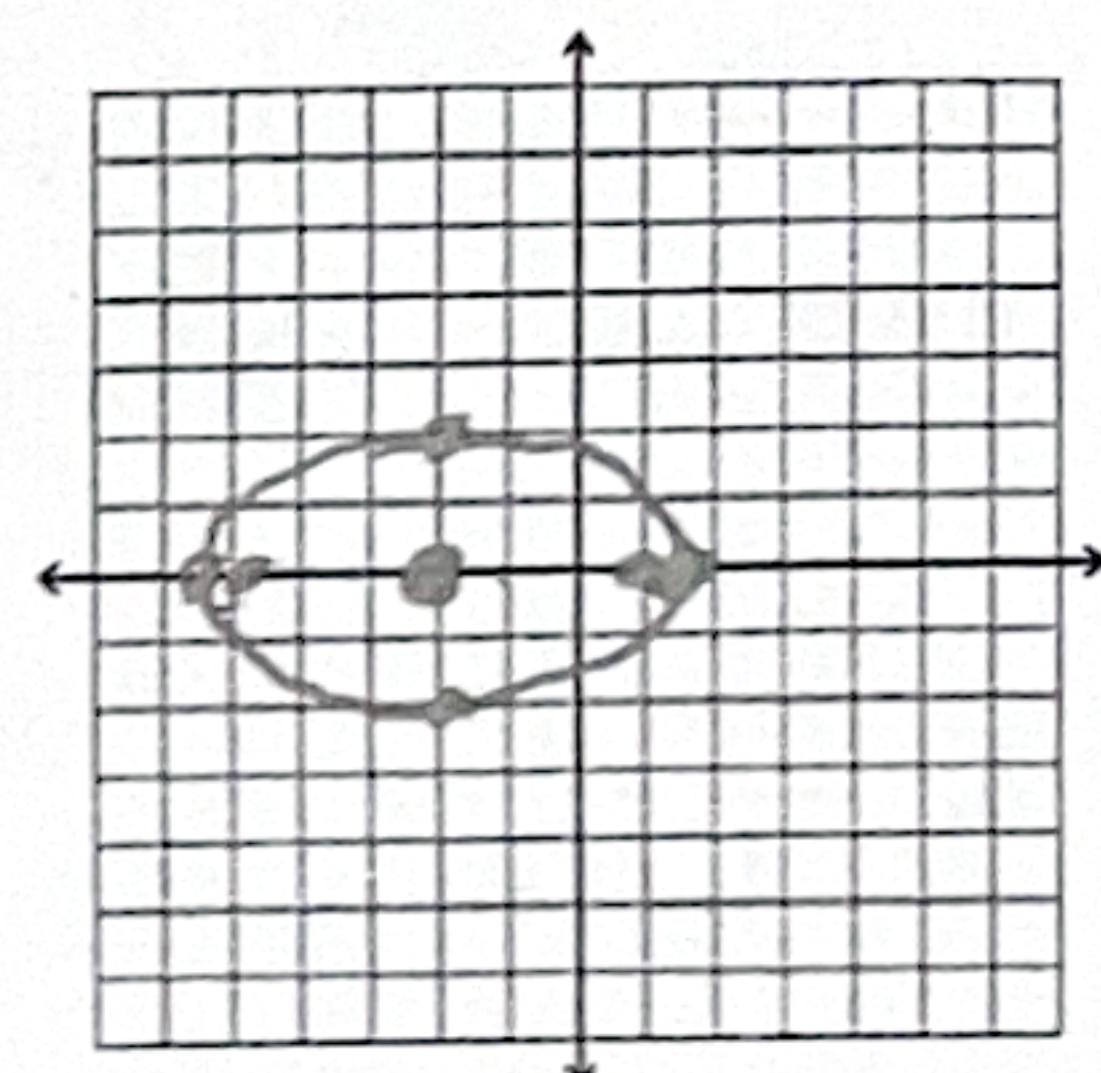


12. $\frac{(x+2)^2}{13} + \frac{y^2}{4} = 1$

$\sqrt{13} \approx 3.6, 2^2 = 4, c = 3$

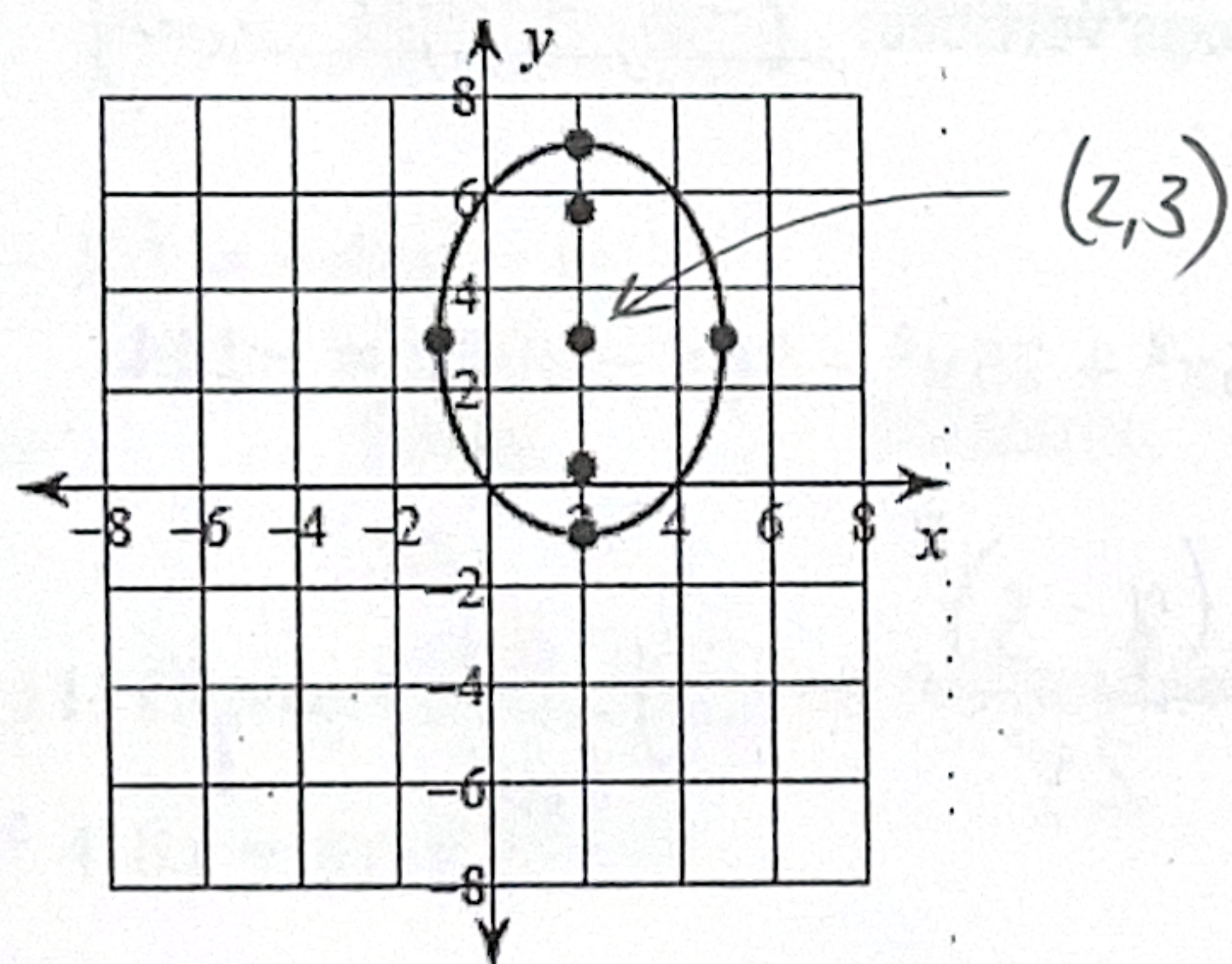
Center: $(-2, 0)$

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



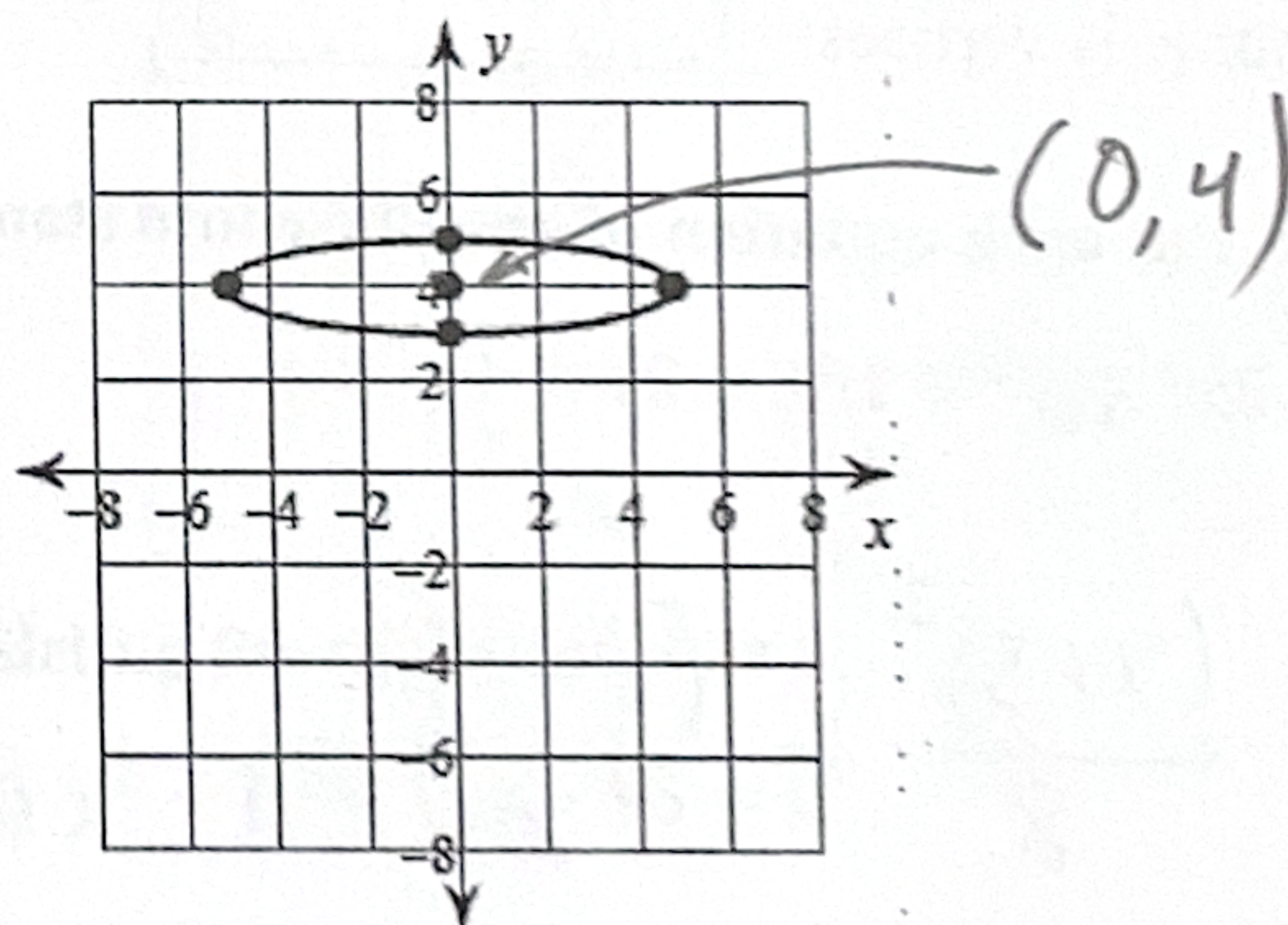
#13-14: Write the equation of each ellipse in standard form. Then find the coordinates of its foci.

13.



$\frac{(x-2)^2}{9} + \frac{(y-3)^2}{16} = 1$

14.



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