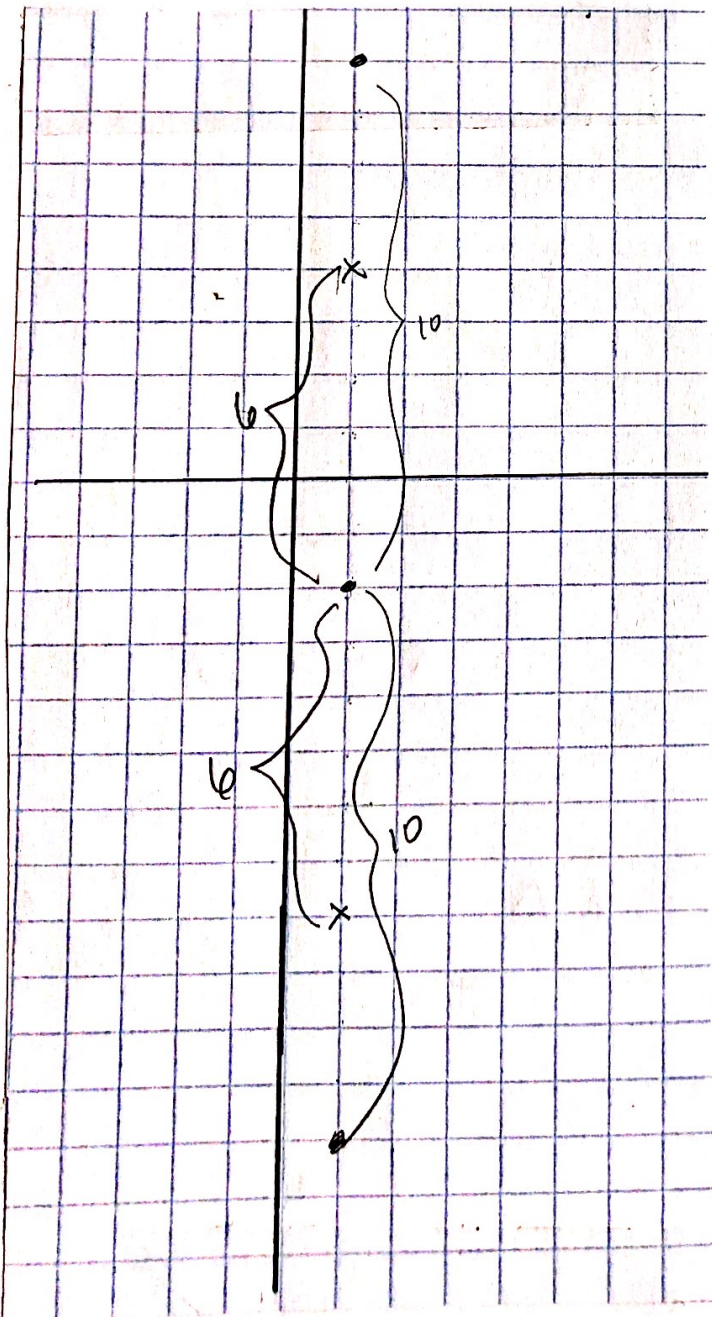


Warm-up 8: Ellipses

Write the standard form of the equation of the ellipse with vertices $(1,8)$ & $(1,-12)$ and foci $(1,4)$ & $(1,-8)$.



Midpoint $(1,8)(1,-12)$
 $\hookrightarrow \left(\frac{1+1}{2}, \frac{8+(-12)}{2}\right) = (1, -2)$
center

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

Vertical
Ellipse \rightarrow

$$\frac{(x-1)^2}{64} + \frac{(y+2)^2}{100} = 1$$

$$a=10 \quad c=6$$
$$a^2=100 \quad c^2=36$$

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

$$36 = 100 - b^2$$

$$-64 = -b^2$$

$$64 = b^2$$

$$b=8$$