Date _____

Conics: Link Sheet

Verbal Description

A racetrack is in the shape of an ellipse, 100 feet long and 50 feet wide. What is the width of the racetrack 10 feet from the vertex?

major axis = 100 ft

minor axis = 50 ft

Algebraic

$2a = 100$

$a = 50$

$2b = 50$

$b = 25$

$(40, y)$

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

$$\frac{x^2}{50^2} + \frac{y^2}{25^2} = 1$$

$$\frac{40^2}{50^2} + \frac{y^2}{25^2} = 1$$

$$\frac{16}{25} + \frac{y^2}{625} = 1$$

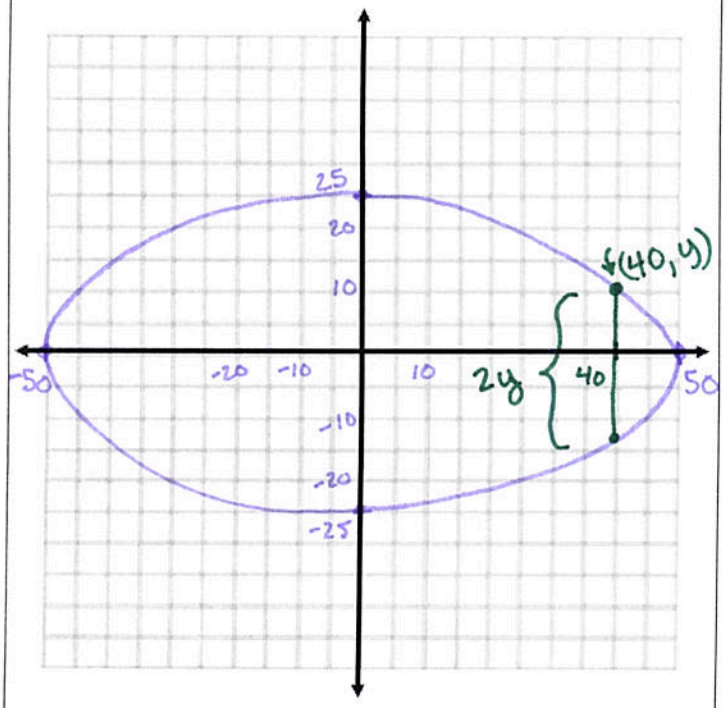
$$\frac{y^2}{625} = \frac{9}{25}$$

$$y^2 = 225$$

$$y = 15$$

$\therefore, 2y = 30$

Graphical



Written Conclusion

The width of the racetrack 10 feet from the vertex is 30 feet.