To determine the coordinates of the foci:

$$\left.\begin{aligned} c^2 &= a^2 - b^2 \\ c^2 &= b^2 - a^2 \end{aligned}\right\}$$ whichever of a or b is bigger (major axis)

Examples:

a) 10 units

b) 8 units (-5,0)

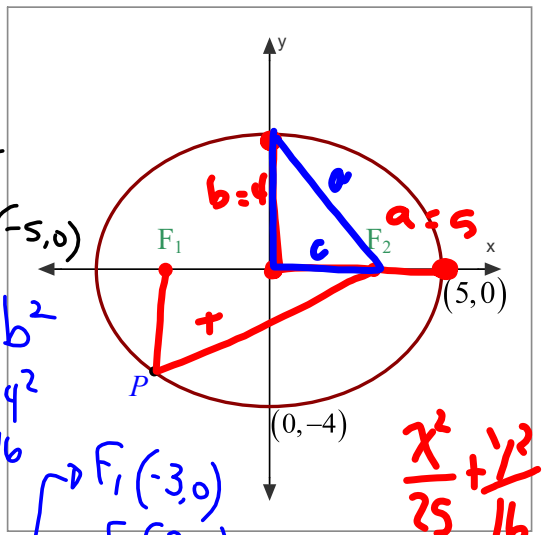
c) $c^2 = a^2 - b^2$

$c^2 = 5^2 - 4^2$

$c^2 = 25 - 16$

$c^2 = 9$

$c = \pm 3$ → $F_1(-3,0)$ $F_2(3,0)$



Find....

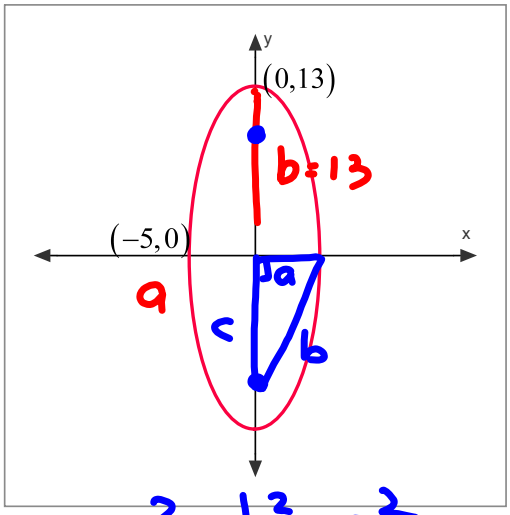
a) length of major axis

b) length of minor axis

c) coordinates of foci

d) total distance from P to both foci 10u

e) the equation of the locus (ellipse) $\frac{x^2}{25} + \frac{y^2}{16} = 1$



$a = 5$

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

$c^2 = 169 - 25$

$c^2 = 144$

$c = \pm 12$

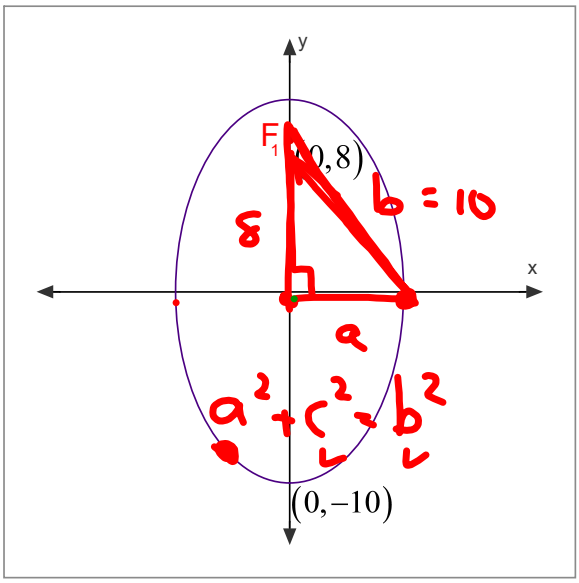
Determine...

a) the coordinates of the foci

$F_1(0,12)$ $F_2(0,-12)$

b) the equation of the ellipse

$\frac{x^2}{25} + \frac{y^2}{169} = 1$



Determine...

a) the length of the minor axis

$a^2 = b^2 - c^2 = 100 - 64 = 36$

b) the equation of the ellipse

$\frac{x^2}{36} + \frac{y^2}{100} = 1$

$a = \pm 6$

$\therefore$ minor $= 2a = 12$

The Ellipse - General Form

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

$$36\left(\frac{x^2}{4}+\frac{y^2}{9}=1\right)$$ Get rid of the denominators

$\frac{36x^2}{4} + \frac{36y^2}{9} = 36$ 1

$$9x^2+4y^2=36$$

$$9x^2+4y^2-36=0$$ General Form

General Form: $Ax^2 + By^2 - C = 0$

Example: Convert to standard form

$$16x^2 + 25y^2 - 400 = 0$$

$+400 \quad +400$

$16x^2 + 25y^2 = 400$

Make RHS equal to 1 by dividing

$$\frac{16x^2}{400} + \frac{25y^2}{400} = 1$$

Reduce the fractions

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