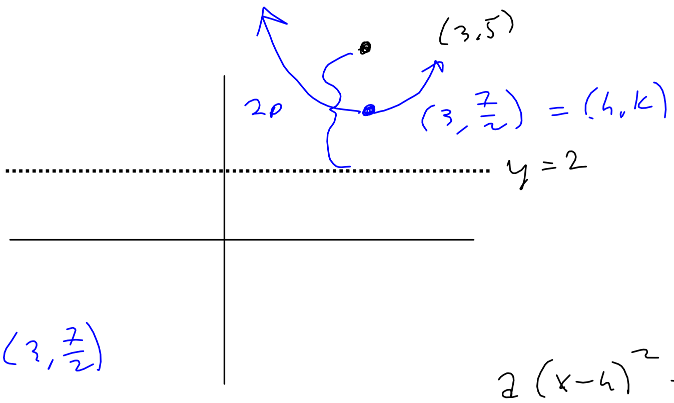
$F = (0, -3)$

$D = y = 3$

$F: (3, 5)$

$y = 2$



$(h,k) = (3, \frac{7}{2})$

$a(x-h)^2 + k$

$a(x-3)^2 + \frac{7}{2}$

$a = \frac{1}{4p}$

$2p = 3$

$p = \frac{3}{2}$

$\frac{1}{6}(x-3)^2 + \frac{7}{2}$

$a = \frac{1}{4p} = \frac{1}{4(\frac{3}{2})} = \frac{1}{6}$

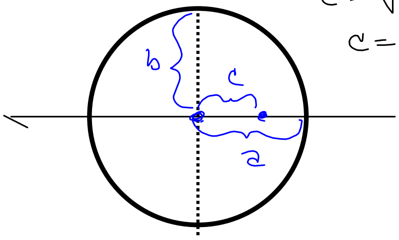
$2 + \frac{3}{2} = \frac{7}{2}$

$a = \frac{1}{6}$

7.2.37 12 of 28

Sketch the graph of each ellipse and identify the foci.

$36x^2 - 432x + 25y^2 + 250y = -1021$



$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

If $a>b$, then $c = \sqrt{a^2 - b^2}$

If $b > a$, then $c = \sqrt{b^2 - a^2}$

c = focal length (from center)

$36x^2 - 432x \quad + 25y^2 + 250y \quad = -1021$

$36(x^2 - 12x + 6^2) + 25(y^2 + 10y + 5^2) = -1021 + 36(6^2) + 25(5^2)$

$= -1021$

$36(x-6)^2 + 25(y+5)^2 = 900$

$\frac{\cancel{36}}{\cancel{900}} = \frac{1}{25}$ $\quad \frac{\cancel{25}}{\cancel{900}} = \frac{1}{44}$

$-1021 + 625 + 1296$

$625 + 1296 = 1921$

$1921 - 1021 = 900$

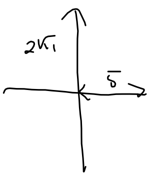
$$\frac{(x-6)^2}{25} + \frac{(y+5)^2}{44} = 1$$

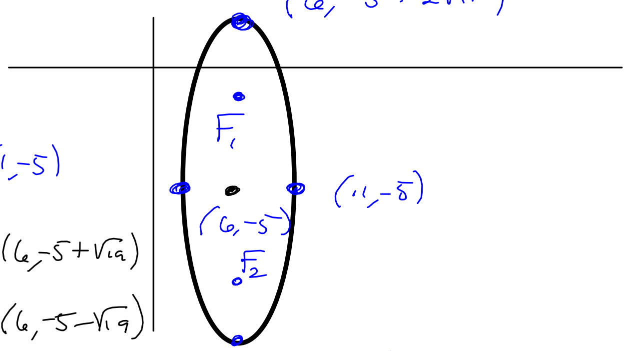
$44 - 25 = 19 = c^2$

$\Rightarrow c = \sqrt{19}$

$\sqrt{44}$: $2 \,|\, 44$, $2 \,|\, 22$, 11

$\sqrt{44} = 2\sqrt{11}$





$F_1 = (6, -5 + \sqrt{19})$

$F_2 = (6, -5 - \sqrt{19})$

$-5 + 2\sqrt{11}$

$9 < 11 < 16$

$3^2 < 11 < 4^2$

$3 < \sqrt{11} < 4$

$2 \cdot 3 < 2\sqrt{11} < 2 \cdot 4$

$-5 + \sqrt{19} < 0$

Write $64x^2 + 49y^2 - 896x + 1274y + 11417 = 3136$ in standard form, and indicate the endpoints of the major and minor axes and the foci in a graph.

$64x^2 - 896x \quad + 49y^2 + 1274y \quad = 3136 - 11417$

Factor out coefficients of x^2 & y^2:

$64(x^2 - 14x + 7^2) + 49(y^2 + 26y + 13^2) = -8281 + 64(49) + 49(169)$

Complete the square inside

Add same thing to right hand side

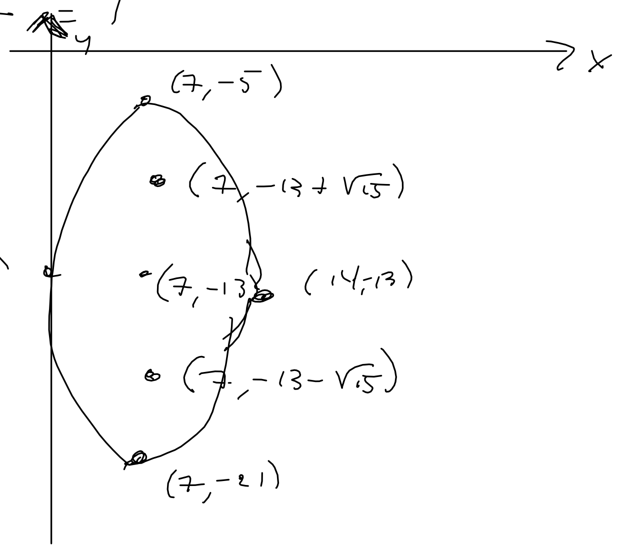
$$64(x-7)^2 + 49(y+13)^2 = 3136$$

$$\frac{64(x-7)^2}{3136} + \frac{49(y+13)^2}{3136} = 1$$

$$\frac{(x-7)^2}{49} + \frac{(y+13)^2}{64} = 1$$

$7 \qquad 8$

$c = \sqrt{64-49} = \sqrt{15}$



Try to be neater than Mills.

Write $2x^2 - 20x + 39$ in standard form, and indicate the focus, vertex and directrix in its graph.

Nov 28-9:10 AM