

6. Graph and label:

$$25x^2 - 4y^2 + 50x + 8y + 121 = 0$$

Write equations of asymptotes, too.

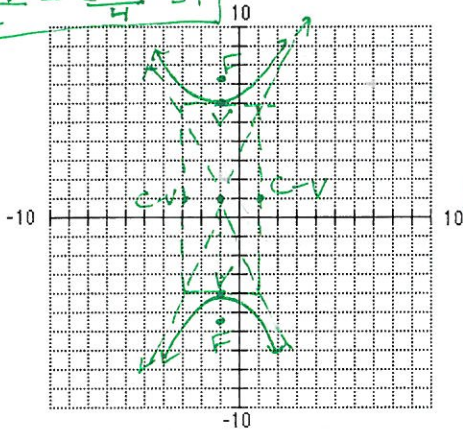
$$25(x^2 + 2x + 1) - 4(y^2 - 2y + 1) = -121$$

$$+ 25 - 4$$

$$= -100$$

$$25(x+1)^2 - 4(y-1)^2$$

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



7. Write the equation of the hyperbola:

Center: $(-2, 4)$ V: $(-2, 7)$

F: $(-2, 4 + \sqrt{15})$

$$\hookrightarrow c = \sqrt{15}$$

$$a^2 + b^2 = c^2$$

$$9 + b^2 = 15$$

$$b^2 = 6$$

$$a^2 + b^2 = c^2$$

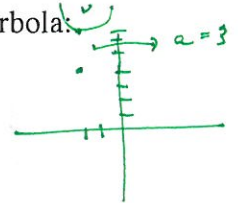
$$\sqrt{29} = c$$

$$F: (-1, 1 \pm \sqrt{29})$$

$$A: y - 1 = \pm \frac{\sqrt{29}}{2}(x + 1)$$

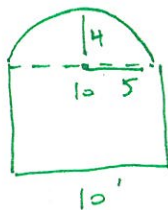
or

$$y = 1 \pm \frac{\sqrt{29}}{2}(x + 1)$$



$$\frac{(y-4)^2}{9} - \frac{(x+2)^2}{6} = 1$$

8. A semi-elliptical arch is to be formed over the entrance to an estate. The arch is to be set on pillars that are 10 feet apart. It will have a height of 4 feet above the pillars. Where should the foci be placed in order to sketch plans for the arch?



$$a^2 = 25$$

$$b^2 = 16$$

$$25 - 16 = c^2$$

$$9 = c^2$$

$$\pm 3 \text{ ft from center}$$

1. Classify.

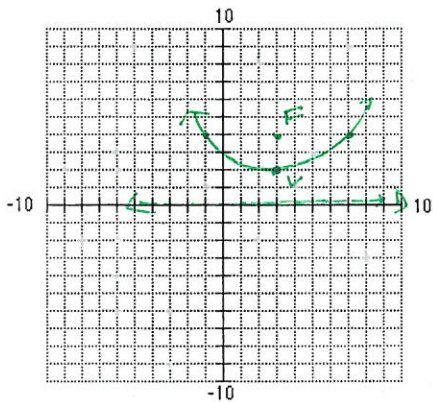
- H $2x^2 - 3y^2 + 4x + 6y + 10 = 0$
- C $2x^2 + 2y^2 + 4x + 6y + 10 = 0$
- P $2x^2 + 4x + 6y + 10 = 0$
- E $2x^2 + 3y^2 + 4x + 6y + 10 = 0$

2. Graph and label:

$$x^2 - 6x - 8y + 25 = 0$$

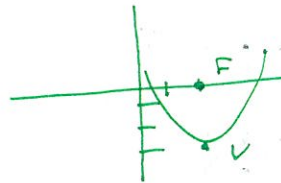
$$x^2 - 6x + 9 = 8y - 25 + 9$$

$$(x-3)^2 = 8(y-4)$$



3. Write the equation of the parabola:

V: (2, -3) F: (2, 0)



$$(x-2)^2 = 12(y+3)$$

4. Graph and label:

$$x^2 + 2y^2 - 4x - 16y + 32 = 0$$

$$x^2 - 4x + 4 + 2(y^2 - 8y + 16) = 32 + 4 + 32$$

$$(x-2)^2 + 2(y-4)^2 = 4$$

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

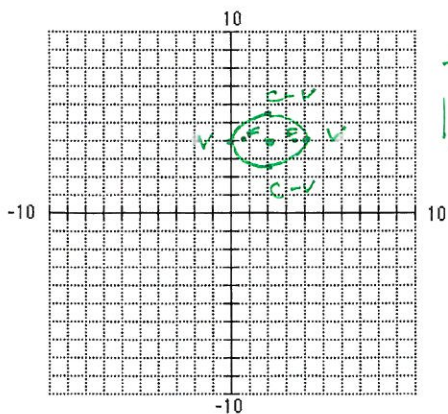
$$4 - 2 = c^2$$

$$\sqrt{2} = c$$

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

$$6 - b^2 = 5$$

$$b^2 = 1$$



$$F: (2 \pm \sqrt{2}, 4)$$

5. Write the equation of the ellipse:

Major axis length: $2\sqrt{6} \rightarrow a = \sqrt{6}$

F: $(-3, 1 \pm \sqrt{5}) \rightarrow c = \sqrt{5}$

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

