

1) Be able to identify the words; focus, vertex, directrix and parabola in a drawing.

Given the following equations, find “p”, the vertex, focus and directrix. It may be helpful to sketch it!

2)  $x = -\frac{1}{24}y^2$

$$p = \underline{6} \quad \frac{1}{4p} = \frac{1}{24}$$

$$V = \underline{(0, 0)} \quad 4p = 24$$

$$F = \underline{(-6, 0)} \quad p = 6$$

$$d: \underline{x = 6}$$

3)  $y = 3x^2$

$$p = \underline{1/12} \quad \frac{1}{4p} = \frac{3}{1}$$

$$V = \underline{(0, 0)} \quad 12p = 1$$

$$F = \underline{(0, 1/12)} \quad p = 1/12$$

$$d: \underline{y = -1/12}$$

4)  $y = -\frac{2}{3}x^2$

$$p = \underline{3/8} \quad \frac{1}{4p} = \frac{2}{3}$$

$$V = \underline{(0, 0)} \quad 8p = 3$$

$$F = \underline{(0, -3/8)} \quad p = 3/8$$

$$d: \underline{y = 3/8}$$

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

$$p = \underline{1} \quad \frac{1}{4p} = \frac{1}{4}$$

$$V = \underline{(2, 0)} \quad 4p = 4$$

$$F = \underline{(3, 0)} \quad p = 1$$

$$d: \underline{x = 1}$$

6)  $y + 3 = 2(x - 1)^2$

$$p = \underline{0.125} \quad \frac{1}{4p} = \frac{2}{1}$$

$$V = \underline{(1, -3)} \quad 8p = 1$$

$$F = \underline{(1, -2.875)} \quad p = 0.125$$

$$d: \underline{y = -3.125}$$

7)  $x = -(y - 7)^2$

$$p = \underline{1/4} \quad \frac{1}{4p} = \frac{1}{1}$$

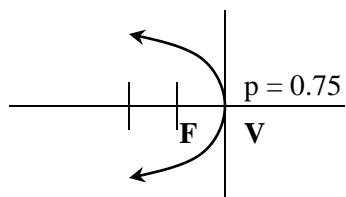
$$V = \underline{(0, 7)} \quad 4p = 1$$

$$F = \underline{(-1/4, 7)} \quad p = 1/4$$

$$d: \underline{x = 1/4}$$

Write an equation for each parabola based on the information given. Again, it may be helpful to sketch the graph!

- 8) Vertex (0, 0)  
Focus (-.75, 0)

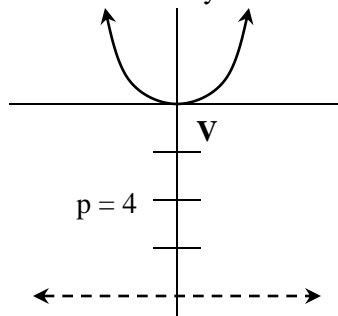


$$x = -\frac{1}{4p} y^2$$

$$x = -\frac{1}{4(0.75)} y^2$$

$$x = -\frac{1}{3} y^2$$

- 9) Vertex (0, 0)  
directrix:  $y = -4$

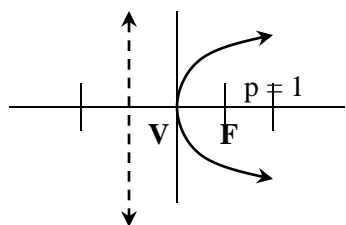


$$y = \frac{1}{4p} x^2$$

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

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

- 10) Focus (1, 0)  
directrix:  $x = -1$

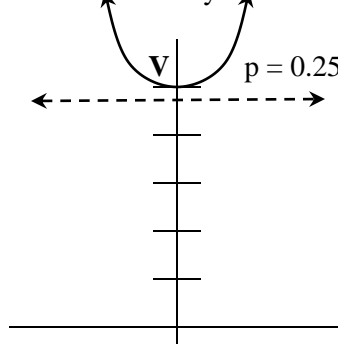


$$x = \frac{1}{4p} y^2$$

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

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

- 11) Vertex (0, 5)  
directrix:  $y = 4.75$



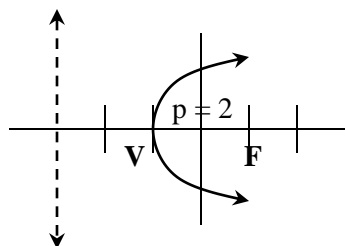
$$y = \frac{1}{4p} x^2$$

$$y = \frac{1}{4(0.25)} x^2$$

$$y = \frac{1}{1} x^2$$

$$y - 5 = x^2$$

- 12) Focus (1, 0)  
directrix:  $x = -3$



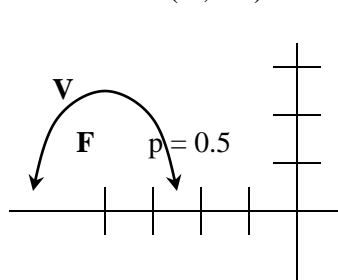
$$x = \frac{1}{4p} y^2$$

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

$$x = \frac{1}{8} y^2$$

$$x + 1 = \frac{1}{8} y^2$$

- 13) Focus (-4, 2)  
Vertex (-4, 2.5)



$$y = -\frac{1}{4p} x^2$$

$$y = -\frac{1}{4(0.5)} x^2$$

$$y = -\frac{1}{2} x^2$$

$$y - 2.5 = -\frac{1}{2} (x + 4)^2$$

Find the vertex, focus and directrix for the following equations.

14)  $y = 2x^2 - 8x + 10$

Divide by 2

$$y/2 = x^2 - 4x + \underline{\quad} + 5 - \underline{\quad}$$

$$y/2 = x^2 - 4x + \underline{4} + 5 - \underline{4}$$

$$y/2 = (x - 2)^2 + 1$$

$$2 [y/2 = (x - 2)^2 + 1]$$

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

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

15)  $x = -\frac{1}{4} y^2 - 3y + 2$

Multiply by (-4)

$$-4x = y^2 + 12y + \underline{\quad} - 8 - \underline{\quad}$$

$$-4x = y^2 + 12y + \underline{36} - 8 - \underline{36}$$

$$-4x = (y + 6)^2 - 44$$

$$-1/4 [-4x = (y + 6)^2 - 44]$$

$$x = -1/4(y + 6)^2 + 11$$

$$x - 11 = -1/4(y + 6)^2$$