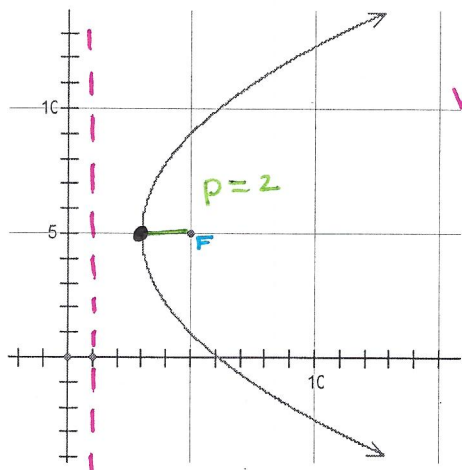


PARABOLAS – 17.3

1. Write the standard equation for the parabola.



Vertical Directrix

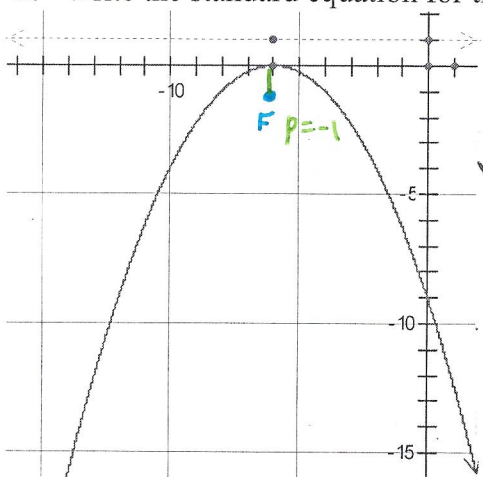
$$x = 1$$

$$V(h, k)$$

$$x - h = \frac{1}{4p} (y - k)^2$$

$$x - 3 = \frac{1}{8} (y - 5)^2$$

2. Write the standard equation for the parabola.



Horizontal Directrix

$$y = 1$$

$$V(h, k)$$

$$y - k = \frac{1}{4p} (x - h)^2$$

$$y - 0 = \frac{1}{-4} (x - 6)^2$$

↓

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

3. $4x + y^2 - 6y = 7$

Vertex form	$x - 4 = \frac{1}{-4} (y - 3)^2$
vertex	$V(4, 3)$
focus	$F(3, 3)$
directrix	$x = 5$

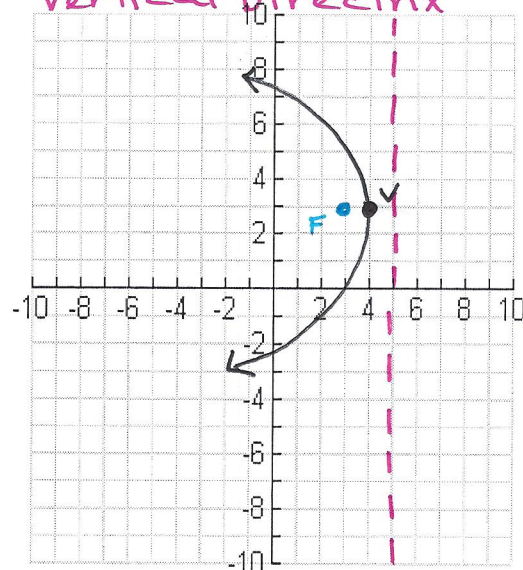
$$y^2 - 6y + \frac{9}{-4} = -4x + 7 + \frac{9}{-4}$$

$$\frac{(y - 3)^2}{-4} = \frac{-4x + 16}{-4}$$

$$\frac{1}{-4} (y - 3)^2 = x - 4 \rightarrow x - \underset{h}{4} = \frac{1}{-4} (y - \underset{k}{3})^2$$

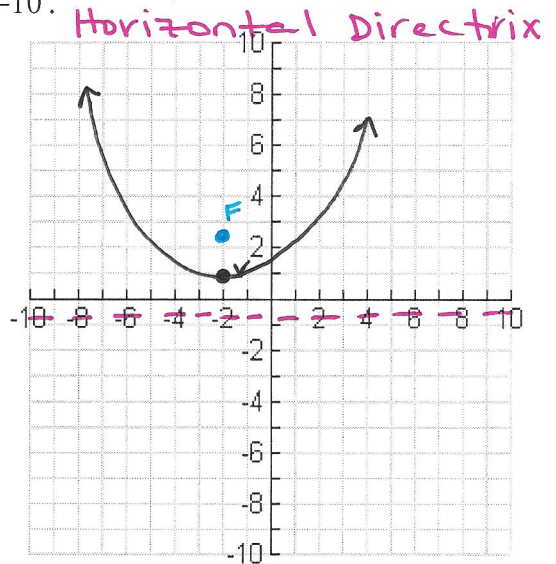
↓
 $p = -1$

Vertical Directrix



4. Complete the table and graph the parabola $x^2 + 4x - 6y = -10$.

Vertex Form	$y - 1 = \frac{1}{6}(x + 2)^2$
vertex	$v(-2, 1)$
focus	$F(-2, 2.5)$
directrix	$y = -0.5$



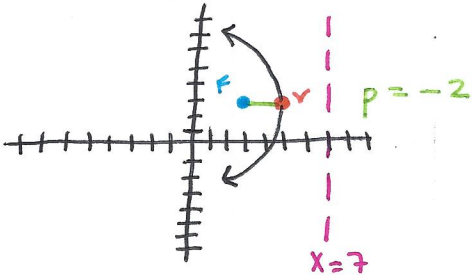
$$x^2 + 4x + \frac{4}{6} = 6y - 10 + \frac{4}{6}$$

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

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

$$\rightarrow \frac{1}{6} = \frac{1}{4p} \rightarrow p = 1.5$$

5. Write the equation for the parabola in vertex form with a vertex $(5, 3)$ and directrix $x = 7$.

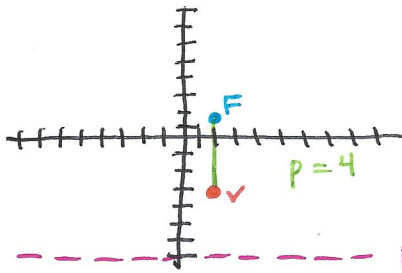


Vertical Directrix

$$x - h = \frac{1}{4p}(y - k)^2$$

$$x - 5 = \frac{1}{-8}(y - 3)^2$$

6. Write the equation for the parabola in vertex form with a vertex $(2, -3)$ and focus $(2, 1)$.

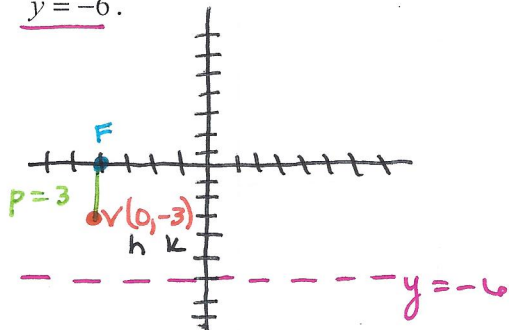


$$y - k = \frac{1}{4p}(x - h)^2$$

$$y + 3 = \frac{1}{16}(x - 2)^2$$

7. Write the equation for the parabola in vertex form with a focus at $(-4, 0)$ and directrix

$y = -6$.



Horizontal Directrix

$$y - k = \frac{1}{4p}(x - h)^2$$

$$y + 3 = \frac{1}{12}(x - 0)^2$$

$$y + 3 = \frac{1}{12}x^2$$

Sketch a graph!