

$$1.) \frac{4x^2}{30} + \frac{8y^2}{30} = \frac{30}{30}$$

$$\frac{4x^2}{30} + \frac{8y^2}{30} = 1 \quad \text{Ellipse}$$

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

$$3.) 2 \left(\frac{x^2}{2} + \frac{y^2}{2} \right) = (5)2$$

$$x^2 + y^2 = 10 \quad \text{circle}$$

$$2.) \frac{2y^2}{16} - \frac{x^2}{16} = \frac{16}{16}$$

$$\frac{y^2}{8} - \frac{x^2}{16} = 1 \quad \text{Hyperbola}$$

$$4.) y^2 - 2x = 6$$

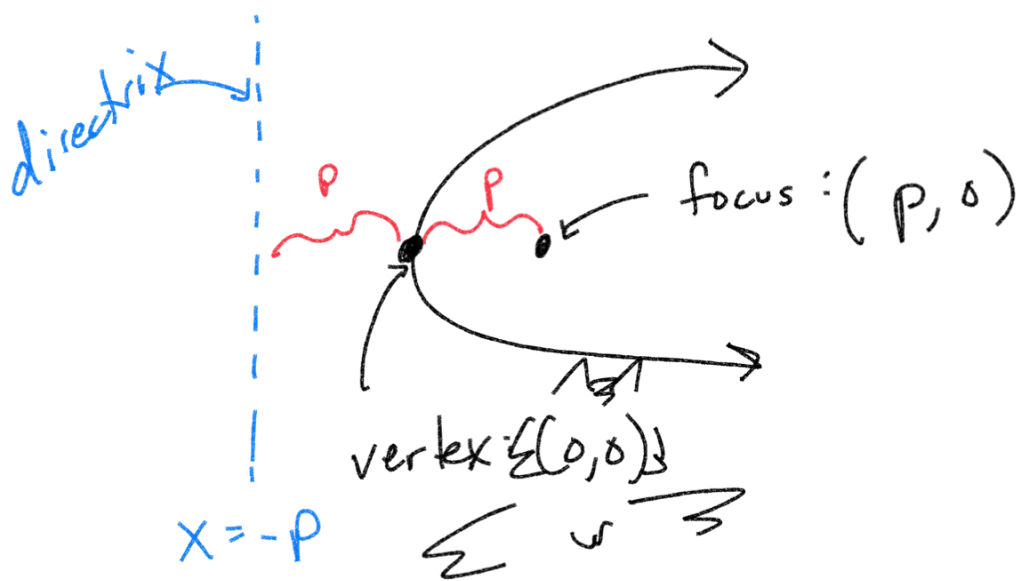
$$+2x \quad +2x -6$$

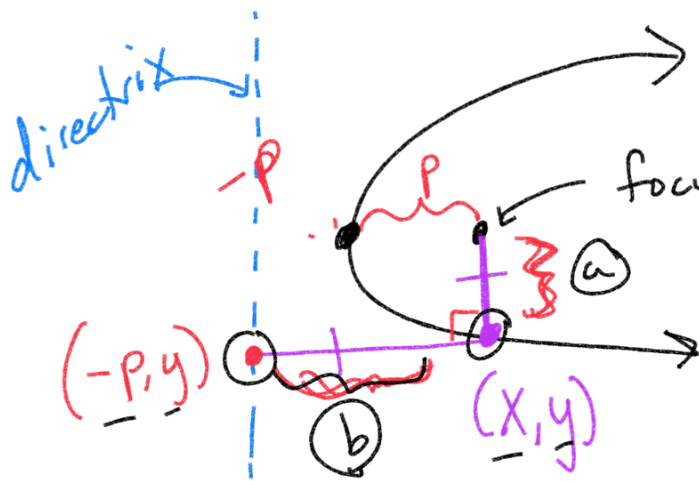
$$-6 \quad \text{parabola}$$

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

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

The Parabola





A parabola is a line that is equidistant from the focus and directrix

Distance Formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

focus $(p, 0)$ (a)

(x, y)
 x_2, y_2

$$\sqrt{(x - p)^2 + (y - 0)^2}$$

$$\sqrt{(x - p)(x - p) + y^2}$$

$$a = \sqrt{x^2 - 2px + p^2 + y^2}$$

$$a = b$$

Premise $a = b$

(b) (x, y) $(-p, y)$
 x_2, y_2 x_1, y_1

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(x + p)^2 + (y - y)^2}$$

$$\sqrt{(x + p)^2} = x + p$$

$$\left(\sqrt{x^2 - 2px + p^2 + y^2}\right)^2 = (x + p)^2$$

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

$$(x + p)(x + p)$$

$$x^2 - 2px + p^2 + y^2 = x^2 + 2px + p^2$$

$$y^2 = 4px$$

