MTH-PT Trigonometry Session 29/30 5/13

1.) $2\left(\frac{x^2}{2} + \frac{y^2}{2}\right) = (5)2$

Circle

$(x-h)^2 + (y-k)^2 = r^2$

(h,k) = center

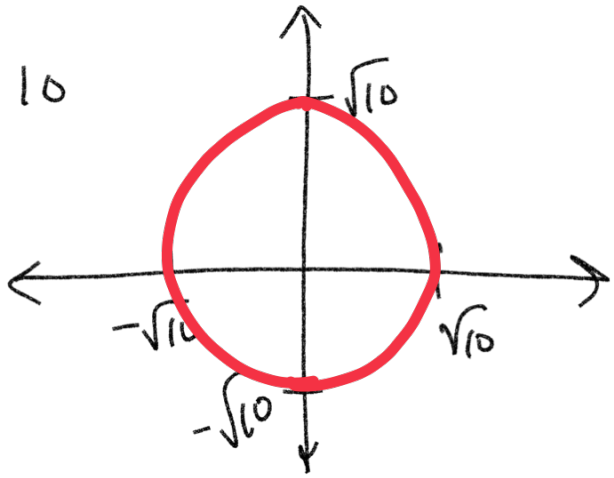
$x^2 + y^2 = \sqrt{10}$

Center

$(0,0)$

$r = \sqrt{10}$

$(x-0)^2 + (y-0)^2 = 10$



2.) $\frac{4x^2}{64} + \frac{8y^2}{64} = \frac{64}{64}$

Ellipse

$\frac{x^2}{16} + \frac{y^2}{8} = 1$

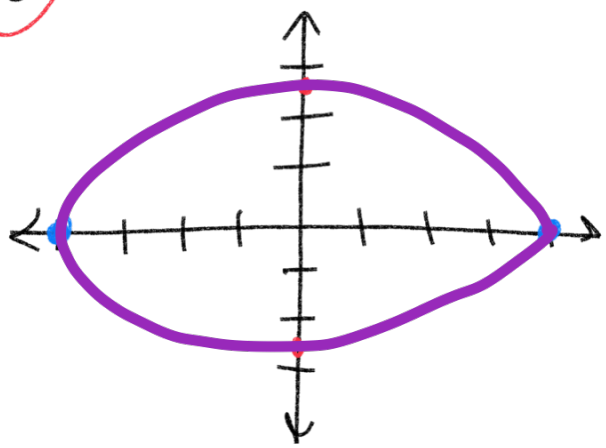
$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

$\sqrt{16} = \sqrt{a^2}$

$\pm 4 = a$

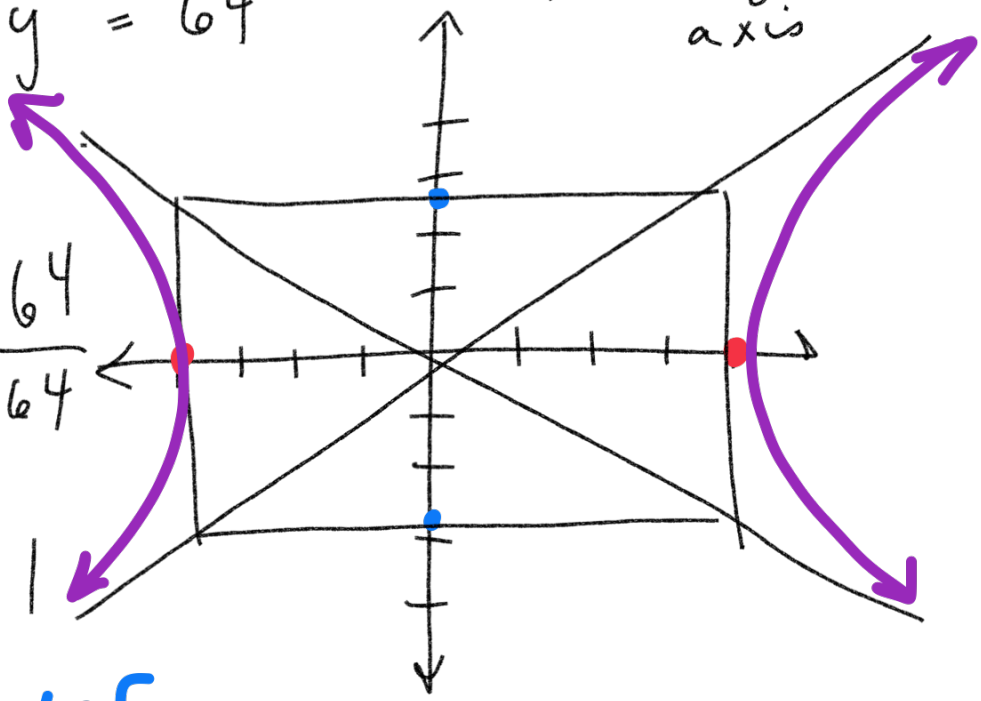
$\sqrt{8} = \sqrt{b^2}$

$\pm 2\sqrt{2}$



3.) $4x^2 - 8y^2 = 64$

positive gives the axis



Hyperbola

$$\frac{4x^2}{64} - \frac{8y^2}{64} = \frac{64}{64}$$

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

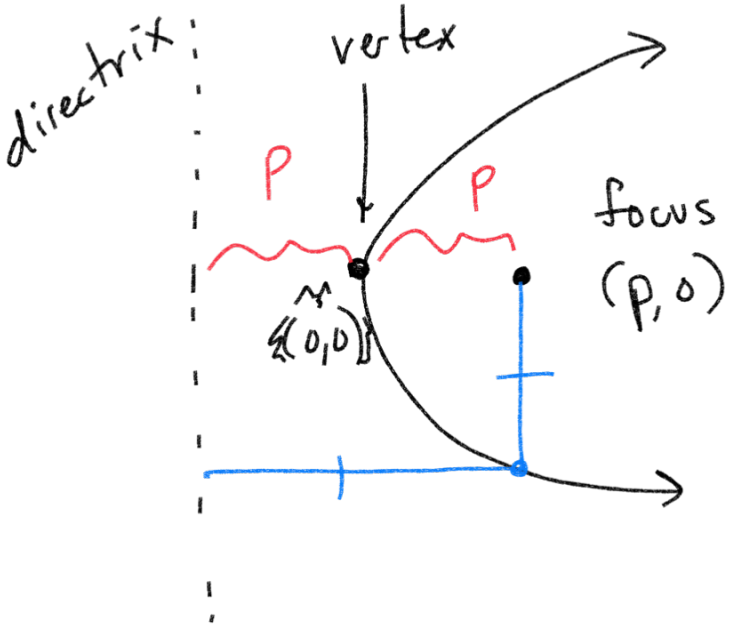
$\sqrt{16} = \pm 4$ $\sqrt{8} = \pm 2\sqrt{2}$

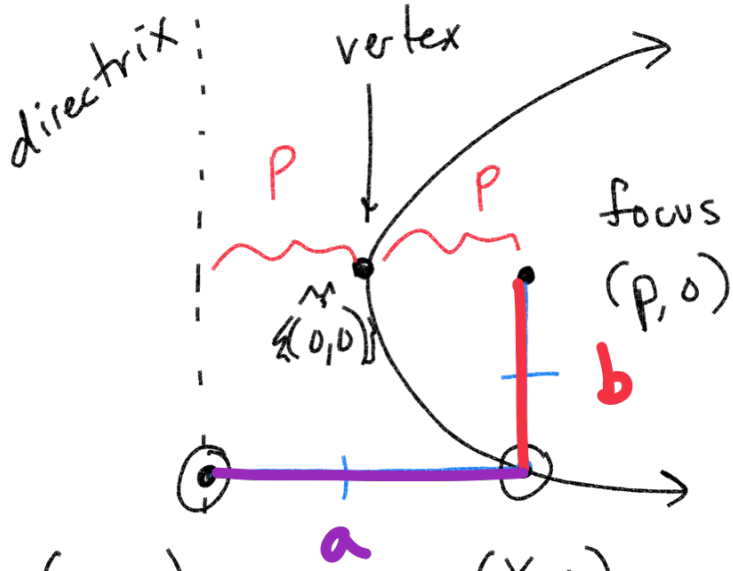
4.) $y^2 - 2x = 6$ parabola $y = x^2$

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

The Parabola

$y^2 = 4px$





Premise $\boxed{a = b}$

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

$(-p, y)$: (x, y)

Distance formula

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

a $(x, y), (-p, y)$

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

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

b $(x, y), (p, 0)$

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

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

$a = b$

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

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

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

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

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

$+2xp$ $\quad$ $+2xp$

$$\boxed{4xp = y^2}$$