[1] What is the eccentricity & type of the conic ?

$$r = \frac{16}{3 - 5\cos\theta} \frac{\frac{1}{3}}{\frac{1}{3}} = \frac{\frac{16}{3}}{1 - \frac{5}{3}\cos\theta} \implies e = \frac{5}{3} \implies \text{hyperbola}$$

[2] What is the equation of the directrix ? <u>Plot on the graph paper below.</u>

$$ep = \frac{16}{3} \implies \frac{5}{3}p = \frac{16}{3} \implies p = \frac{16}{5} \implies \text{directix } x = -\frac{16}{5}$$

[3] Find the <u>polar AND rectangular</u> coordinates of the x - and y - intercepts. Do not convert the original polar equation into a rectangular equation. (It's a HUGE waste of time.)

$\theta$	0	$\frac{\pi}{2}$	$\pi$	$\frac{3\pi}{2}$
r	-8	$\frac{16}{3}$	2	$\frac{16}{3}$
$(r, \theta)$	(-8, 0)	$\left(\frac{16}{3},\frac{\pi}{2}\right)$	$(2,\pi)$	$\left(\frac{16}{3},\frac{3\pi}{2}\right)$
(x, y)	(-8, 0)	$(0, \frac{16}{3})$	(-2, 0)	$(0, -\frac{16}{3})$

[4] What are the rectangular coordinates of the vertices ? <u>Plot on the graph paper.</u>

$$(-8, 0)$$
 and  $(-2, 0)$ 

[5] What are the rectangular coordinates of the endpoints of one latus rectum ? Plot on the graph paper.

 $(0, \frac{16}{3})$  and  $(0, -\frac{16}{3})$ 

[6] What are the rectangular coordinates of the center ? <u>Plot on the graph paper.</u>

$$\left(\frac{-8+-2}{2},0\right) = (-5,0)$$

[7] What are the rectangular coordinates of both foci ? <u>Plot on the graph paper.</u>

(0, 0) and  $(2 \times -5, 0) = (-10, 0)$ 

[8] What are the rectangular coordinates of the endpoints of the other latus rectum? Plot on the graph paper.

$$(-10, \frac{16}{3})$$
 and  $(-10, -\frac{16}{3})$ 

[9] Graph the conic by connecting the points from [4], [5] and [8] appropriately.

