

SCORE: ____ / 10 POINTS

NO CALCULATORS ALLOWED

For the conic $r = \frac{12}{4 - 3\sin\theta}$:

- [1] Find the eccentricity and classify the type of the conic.
- [2] Find the rectangular equation of the directrix.
- [3] Find the center and all foci in either polar or rectangular coordinates.
- [4] Sketch the latera recta (plural of latus rectum).
- [5] Sketch the conic.

$$r = \frac{12}{4 - 3\sin\theta} \cdot \frac{\frac{1}{4}}{\frac{1}{4}} = \frac{3}{1 - \frac{3}{4}\sin\theta}$$

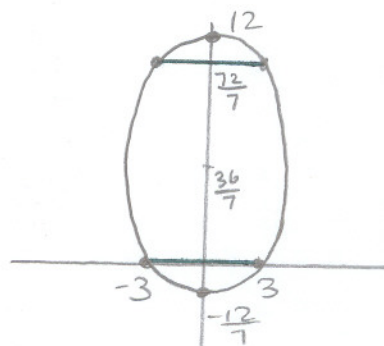
$$e = \frac{3}{4} \Rightarrow \text{ELLIPSE (WITH HORIZONTAL DIRECTRIX)}$$

$$ep = 3$$

$$\frac{3}{4}p = 3$$

$$p = 4 \text{ UNITS BELOW POLE} \Rightarrow y = -4$$

θ	r
0	3
$\pi/2$	12
π	3
$3\pi/2$	$12/7$



$$\frac{1}{2}(12 + -\frac{12}{7}) = \frac{1}{2}(\frac{72}{7}) = \frac{36}{7}$$

$$2(\frac{36}{7}) = \frac{72}{7}$$

CENTER AT $(0, \frac{36}{7})$ OR $(\frac{36}{7}, \frac{\pi}{2})$
 FOCUS AT $(0, \frac{72}{7})$ OR $(\frac{72}{7}, \frac{\pi}{2})$

AND $(0, 0)$ OR $(0, \theta)$
 OR

GRAPH OF ELLIPSE
 THROUGH VERTICES
 AND ENDS OF
 LATERS RECTA 2