**Math 49B**
**Group Quiz 6**
**Wed Feb 20, 2008**

**Names:** _____

# THIS IS A NO GRAPHING CALCULATOR QUIZ

**[6 POINTS]** Identify the eccentricity, directrix and type of the conic $r = \dfrac{12}{3 - \sin\theta}$. Sketch the graph (with its latera recta (plural of latus rectum)) on the rectangular grid provided, and find the coordinates of all intercepts.

ECCENTRICITY : $\frac{1}{3}$ 1

TYPE : ELLIPSE $\frac{1}{2}$

DIRECTRIX : $\frac{1}{2}$ $y = -12$ 1

INTERCEPTS : $(4,0)\ (6,\frac{\pi}{2})\ (4,\pi)\ (3,\frac{3\pi}{2})$

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

$e = \frac{1}{3}$

$ep = 4$

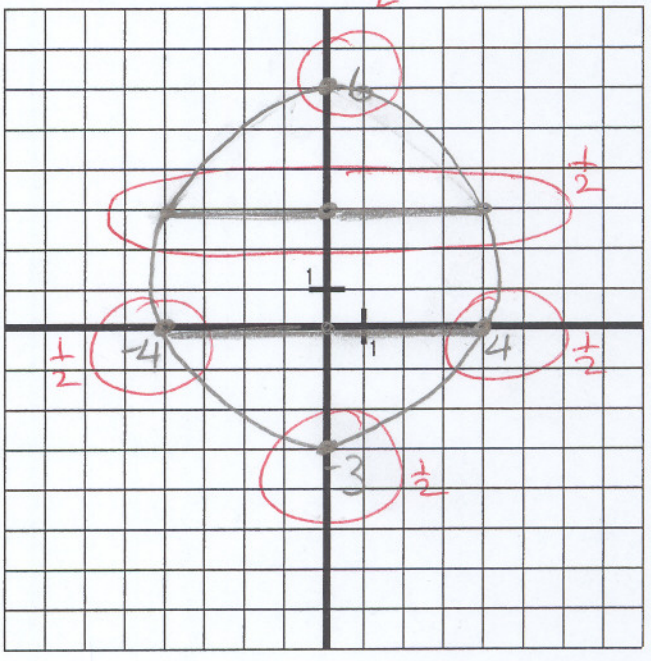
$\frac{1}{3}p = 4$

$p = 12$

| $\theta$ | $r$ |
|---|---|
| $0$ | $4$ |
| $\frac{\pi}{2}$ | $6$ |
| $\pi$ | $4$ |
| $\frac{3\pi}{2}$ | $3$ |

CENTER $= \frac{1}{2}(6+-3)$
$= \frac{3}{2}$

FOCUS $= 2(\frac{3}{2})$
$= 3$ $\frac{1}{2}$




**[4 POINTS]** Find a polar equation of the ellipse with its vertices at $\left(3, \dfrac{\pi}{2}\right)$ and $\left(1, \dfrac{3\pi}{2}\right)$. Simplify your final answer.

$r = \dfrac{ep}{1 - e\sin\theta}$ $\frac{1}{2}$

$3 = \dfrac{ep}{1 - e\sin\frac{\pi}{2}} = \dfrac{ep}{1-e} \Rightarrow ep = 3(1-e)$ $\frac{1}{2}$

$1 = \dfrac{ep}{1 - e\sin\frac{3\pi}{2}} = \dfrac{ep}{1+e} \Rightarrow ep = 1+e$ $\frac{1}{2}$

$3(1-e) = 1+e$

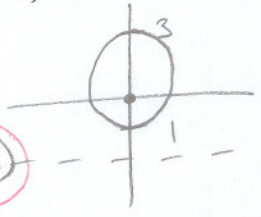
$3 - 3e = 1 + e$

$-4e = -2$

$e = \frac{1}{2}$ $\frac{1}{2}$

$\frac{1}{2}p = 1\frac{1}{2}$

$p = 3$ $\frac{1}{2}$




$\frac{1}{2}$

$r = \dfrac{\frac{3}{2}}{1 - \frac{1}{2}\sin\theta} \cdot \dfrac{2}{2}$ $\frac{1}{2}$

$r = \dfrac{3}{2 - \sin\theta}$ $\frac{1}{2}$