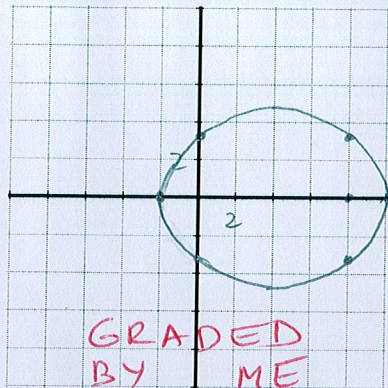


Consider the graph of the polar equation $r = \frac{10}{3 - 2\cos\theta} \cdot \frac{\frac{1}{3}}{\frac{1}{3}} = \frac{\frac{10}{3}}{1 - \frac{2}{3}\cos\theta}$

SCORE: ____ / 9 PTS



[a] Fill in the blanks.

[i] The eccentricity is $\frac{2}{3}$ ①

[ii] The shape of the graph is a/an ELLIPSE ①

[iii] The equation of the directrix is $x = -5$ ①
 $ep = \frac{10}{3} \rightarrow \frac{2}{3}p = \frac{10}{3}$

[iv] Find the rectangular coordinates of the

x - intercept(s) $(10, 0), (-2, 0)$ ①

y - intercept(s) $(0, \pm \frac{10}{3})$ ①

focus/foci $(0, 0), (8, 0)$ ①

endpoints of the latus rectum/latera recta $(0, \pm \frac{10}{3}), (8, \pm \frac{10}{3})$ ①

$$\text{CENTER} = \left(\frac{10 + (-2)}{2}, 0 \right) = (4, 0)$$

$$\text{FOCUS} = (2 \cdot 4, 0) = (8, 0)$$

θ	r	
0	10	VERTICES
$\frac{\pi}{2}$	$\frac{10}{3}$	
π	2	ENDPOINTS OF L.R.
$\frac{3\pi}{2}$	$\frac{10}{3}$	

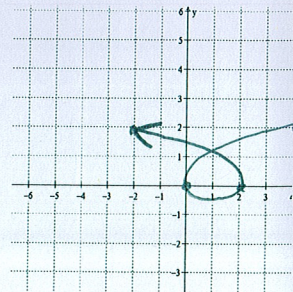
[b] Sketch the graph on the grid provided above. You must provide a scale for the axes & plot all points from part [a][iv] above.

Sketch the curve represented by the parametric equations $x = t + 3t^2 - 2t^3$ for $-1 \leq t \leq 2$
 $y = t^2 - t$

SCORE: ____ / 4 PTS

by plotting at least 4 points. Indicate the orientation (direction) of the curve.

t	x	y	
-1	4	2	$\left(\frac{1}{2}\right)$
0	0	0	$\left(\frac{1}{2}\right)$
1	2	0	$\left(\frac{1}{2}\right)$
2	-2	2	$\left(\frac{1}{2}\right)$



GRADED
BY ME

Find parametric equations for the circle that has a diameter with endpoints $(-5, -3)$ and $(12, -3)$.

SCORE: ____ / 3 PTS

$$\text{CENTER} = \left(\frac{-5+12}{2}, -3 \right) = \left(\frac{7}{2}, -3 \right) \textcircled{\frac{1}{2}}$$

$$\text{RADIUS} = \frac{1}{2}(12 - (-5)) = \frac{17}{2} \textcircled{\frac{1}{2}}$$

$$x = \frac{17}{2} \cos t + \frac{7}{2} \textcircled{1}$$

$$y = \frac{17}{2} \sin t - 3 \textcircled{1}$$

AJ is standing 24 feet from BJ, who is 5 feet tall. AJ throws a football at 30 feet per second in BJ's direction, **SCORE: _____ / 3 PTS** at an angle of 60° with the horizontal, from an initial height of 6 feet. Write parametric equations for the position of the football.

$$x = (v_0 \cos \theta)t$$

$$y = h_0 + (v_0 \sin \theta)t - 16t^2 \rightarrow$$

$$x = (30 \cos 60^\circ)t$$

$$y = 6 + (30 \sin 60^\circ)t - 16t^2$$

$$\textcircled{1} \underline{x = 15t}$$

$$\textcircled{2} \underline{y = 6 + 15\sqrt{3}t - 16t^2}$$

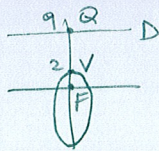
Eliminate the parameter and write the rectangular equation for the curve represented by the parametric equations $x = 3 \ln t$, $y = 4t^6$. Write your final answer in the form y as a simplified function in terms of x .

SCORE: ____ / 4 PTS

$$\frac{x}{3} = \ln t$$
$$\underline{t = e^{\frac{x}{3}}}$$
$$\textcircled{2}$$

$$y = 4(e^{\frac{x}{3}})^6$$
$$\underline{y = 4e^{2x}}$$
$$\textcircled{2}$$

Fill in the blanks.



$$e = \frac{VF}{VQ} = \frac{2}{7}$$

$$r = \frac{\frac{2}{7} \cdot 9}{1 + \frac{2}{7} \sin \theta} \cdot \frac{7}{7}$$

+ ①

SCORE: ____ / 7 PTS

IF YOU WROTE "r ="

ON ALL ANSWERS

- [a] The polar equation of the ellipse with focus at the pole, one vertex at $(x, y) = (0, 2)$ and directrix $y = 9$ is $r = \frac{18}{7 + 2 \sin \theta}$.

$$r = \frac{\frac{7}{2} \cdot 3}{1 - \frac{7}{2} \cos \theta} \cdot \frac{2}{2}$$

- [b] The polar equation of the hyperbola with focus at the pole, eccentricity $\frac{7}{2}$ and directrix $x = -3$ is $r = \frac{21}{2 - 7 \cos \theta}$.

$$r = \frac{1.5}{1 - 1 \cdot \sin \theta}$$

- [c] The polar equation of the parabola with focus at the pole and directrix $y = -5$ is $r = \frac{5}{1 - \sin \theta}$.