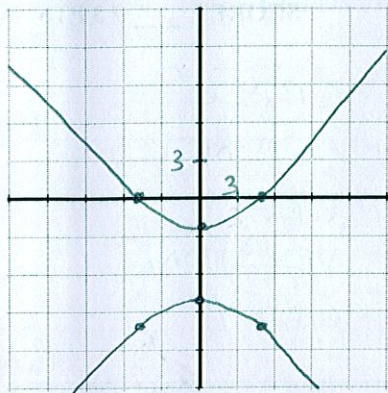


Consider the graph of the polar equation $r = \frac{16}{3 - 5 \sin \theta} = \frac{\frac{16}{3}}{1 - \frac{5}{3} \sin \theta}$ $e = \frac{5}{3}$
 $ep = \frac{16}{3} = \frac{5}{3}p$
 $p = \frac{16}{5}$

SCORE: ____ / 9 PTS



[a] Fill in the blanks.

[i] The eccentricity is $\frac{5}{3}$ ①

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

[iii] The equation of the directrix is $y = -\frac{16}{5}$ ①

[iv] Find the rectangular coordinates of the

x - intercept(s) ① $(\frac{16}{3}, 0)$ $(-\frac{16}{3}, 0)$

y - intercept(s) ① $(0, -8)$ $(0, -2)$

focus/foci ① $(0, -10)$ $(0, 0)$

endpoints of the latus rectum/latera recta ① $(\frac{16}{3}, -10)$ $(-\frac{16}{3}, -10)$
 $(\frac{16}{3}, 0)$ $(-\frac{16}{3}, 0)$

↑
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BY
ME

θ	r
0	$\frac{16}{3}$
$\frac{\pi}{2}$	-8
π	$\frac{16}{3}$
$\frac{3\pi}{2}$	2

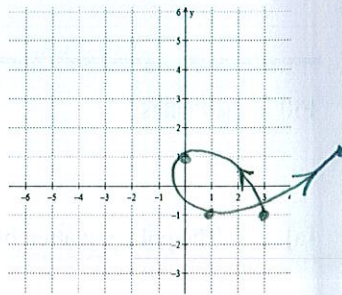
[b] Sketch the graph on the grid provided above. You must provide a scale for the axes & plot all points from part [a][iv] above.

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

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

t	x	y	
-1	3	-1	$(\frac{1}{2}) (3, -1)$
0	0	1	$(\frac{1}{2}) (0, 1)$
1	1	-1	$(\frac{1}{2}) (1, -1)$
2	6	1	$(\frac{1}{2}) (6, 1)$

SCORE: ____ / 4 PTS



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Find parametric equations for the circle that has a diameter with endpoints $(4, -8)$ and $(4, 6)$.

SCORE: ____ / 3 PTS

$$\text{CENTER} = \left(4, \frac{-8+6}{2}\right) = (4, -1) \quad \left(\frac{1}{2}\right)$$

$$\text{RADIUS} = \frac{6 - (-8)}{2} = 7 \quad \left(\frac{1}{2}\right)$$

$$x = 4 + 7 \cos t \quad (1)$$

$$y = -1 + 7 \sin t \quad (1)$$

MUST HAVE
"x=" AND "y="

OTHER ANSWERS POSSIBLE -
TALK TO ME

Find parametric equations for the line through the points $(5, -7)$ and $(-3, -2)$.

SCORE: ____ / 3 PTS

NOTE: Do NOT use either $x = t$ nor $y = t$.

$$x = 5 + (-3-5)t \quad \left(\frac{1}{2}\right)$$

$$y = -7 + (-2-7)t \quad \left(\frac{1}{2}\right)$$

OR

$$x = -3 + (5-(-3))t \quad \left(\frac{1}{2}\right)$$

$$y = -2 + (-7-2)t \quad \left(\frac{1}{2}\right)$$

$$x = 5 - 8t \quad (1)$$

$$y = -7 + 5t \quad (1)$$

MUST HAVE
"x=" AND "y="

$$x = -3 + 8t \quad (1)$$

$$y = -2 - 5t \quad (1)$$

GRADE
AGAINST
ONE
VERSION
ONLY

Eliminate the parameter and write the rectangular equation for the curve represented by the parametric

SCORE: ____ / 5 PTS

equations $x = \frac{3}{2-t}$, $y = \frac{t}{t+1}$. Write your final answer in the form y as a simplified function of x .

$$2-t = \frac{3}{x}$$

$$t = 2 - \frac{3}{x}$$

②

$$y = \frac{2 - \frac{3}{x}}{3 - \frac{3}{x}} \cdot \frac{x}{x}$$

$$y = \frac{2x - 3}{3x - 3}$$

②

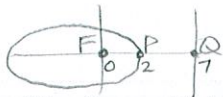
Fill in the blanks.

SCORE: ____ / 6 PTS

MUST HAVE "r=" IN ALL ANSWERS

- [a] The polar equation of the parabola with focus at the pole and directrix $x = -8$ is $r = \frac{\sqrt{8} \cdot \frac{1}{2}}{1 - \cos \theta}$ (1)

- [b] The polar equation of the hyperbola with focus at the pole, eccentricity $\frac{4}{3}$ and directrix $y = 5$ is $r = \frac{\sqrt{20} \cdot \frac{1}{2}}{3 + 4 \sin \theta}$ (1/2)



$$\frac{PF}{PQ} = \frac{2}{5} = e$$

$$r = \frac{\frac{2}{5} \cdot 7}{1 + \frac{2}{5} \cos \theta} \cdot \frac{5}{5}$$

- [c] The polar equation of the ellipse with focus at the pole, one vertex at $(x, y) = (2, 0)$ and directrix $x = 7$ is $r = \frac{\sqrt{14} \cdot \frac{1}{2}}{5 + 2 \cos \theta}$ (1/2)