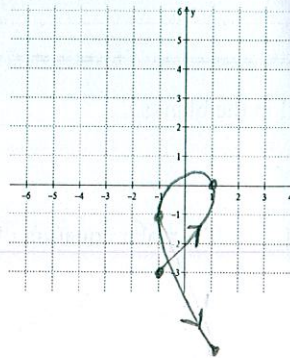


Sketch the curve represented by the parametric equations  $x = \cos \pi t$   
 $y = t - 2t^2$  for  $-1 \leq t \leq 2$

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

SCORE: \_\_\_\_\_ / 4 PTS

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

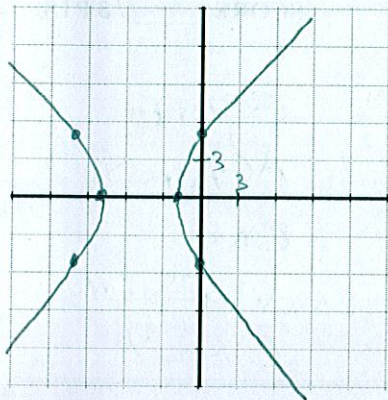


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Consider the graph of the polar equation  $r = \frac{16}{3-5\cos\theta} = \frac{\frac{16}{3}}{1-\frac{5}{3}\cos\theta}$

$e = \frac{5}{3}$   
 $ep = \frac{16}{3} = \frac{5}{3}p$   
 $p = \frac{16}{5}$

SCORE: \_\_\_\_ / 9 PTS



[a] Fill in the blanks.

- [i] The eccentricity is  $\frac{5}{3}$   $\frac{1}{2}$
- [ii] The shape of the graph is a/an HYPERBOLA  $\frac{1}{2}$
- [iii] The equation of the directrix is  $x = -\frac{16}{5}$   $\frac{1}{2}$
- [iv] Find the rectangular coordinates of the  $\frac{1}{2}$

- x - intercept(s)  $\frac{1}{2}$   $(-8, 0) (-2, 0)$
- y - intercept(s)  $\frac{1}{2}$   $(0, \frac{16}{3}) (0, -\frac{16}{3})$
- focus/foci  $\frac{1}{2}$   $(-10, 0) (0, 0)$
- endpoints of the latus rectum/latera recta  $\frac{1}{2}$   $(-10, \frac{16}{3}) (-10, -\frac{16}{3})$   
 $(0, \frac{16}{3}) (0, -\frac{16}{3})$

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

[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.

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  $y = 6$  is  $r = \frac{\sqrt{6} \left(\frac{1}{2}\right)}{1 + \sin \theta}$  ①



$$\frac{PF}{PQ} = \frac{2}{3} = e$$

$$r = \frac{\frac{2}{3} \cdot 5}{1 - \frac{2}{3} \sin \theta} \cdot \frac{3}{3}$$

- [b] The polar equation of the ellipse with focus at the pole, one vertex at  $(x, y) = (0, -2)$  and directrix  $y = -5$  is  $r = \frac{\sqrt{10}}{3 - 2 \sin \theta}$  ①

$$r = \frac{\frac{5}{3} \cdot 4}{1 + \frac{5}{3} \cos \theta} \cdot \frac{3}{3}$$

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

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

SCORE: \_\_\_\_ / 5 PTS

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

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

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

②

$$y = \left[ \frac{\frac{2}{x} - 3}{\frac{2}{x} - 4} \right] \cdot \frac{x}{x}$$

$$y = \frac{2 - 3x}{2 - 4x}$$

②

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

SCORE: \_\_\_\_ / 3 PTS

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

$$\begin{aligned}x &= 7 + (-2-7)t, \textcircled{\frac{1}{2}} \\y &= -5 + (-3-5)t, \textcircled{\frac{1}{2}}\end{aligned}$$

OR

$$\begin{aligned}x &= -2 + (7-(-2))t, \textcircled{\frac{1}{2}} \\y &= -3 + (-5-(-3))t, \textcircled{\frac{1}{2}}\end{aligned}$$

$$\begin{aligned}x &= 7 - 9t, \textcircled{1} \\y &= -5 + 2t, \textcircled{1}\end{aligned}$$

MUST HAVE  
"x=" AND "y="

$$\begin{aligned}x &= -2 + 9t, \textcircled{1} \\y &= -3 - 2t, \textcircled{1}\end{aligned}$$

GRADE  
AGAINST  
ONE  
VERSION  
ONLY

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

SCORE: \_\_\_\_ / 3 PTS

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

$$\text{RADIUS} = \frac{4 - (-6)}{2} = 5 \quad \left( \frac{1}{2} \right)$$

$$x = -1 + 5 \cos t \quad (1)$$

$$y = 8 + 5 \sin t \quad (1)$$

MUST HAVE  
"x=" AND "y="

OTHER ANSWERS POSSIBLE -  
TALK TO ME