Math 43 Quiz 1 – B
Instructor: Cheryl Jaeger Balm Friday, Sept. 30, 2016

Name: Solutions

Problem 1. [2+2=4 points]

(a) Convert $r = 2\sin\theta$ into rectangular form.

$r^2 = 2r\sin\theta$

$\boxed{x^2 + y^2 = 2y}$

(b) Convert $y = -x + 1$ into polar form.

$\boxed{r\sin\theta = -r\cos\theta + 1}$

Problem 2. [4 points] Eliminate the parameter in the parametric equations.

$$\begin{cases} x = 4 - 2\sin(\theta) \\ y = -1 + 3\cos(\theta) \end{cases}$$

$\frac{x-4}{-2} = \sin\theta \qquad \frac{y+1}{3} = \cos\theta$

$\boxed{\frac{(x-4)^2}{4} + \frac{(y+1)^2}{9} = 1}$

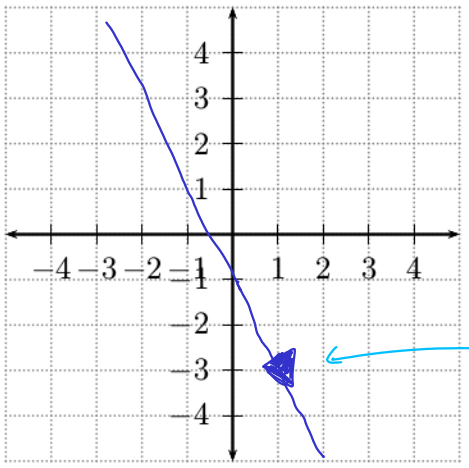
Problem 3. [2 points] Write $y = \frac{1}{x}$ as a set of parametric equations.

$$\begin{cases} x = t \\ y = \frac{1}{t} \end{cases}$$

Problem 4. [4+4+2=10 points]

(a) Graph the parametric curve given by $\begin{cases} x = t \\ y = -2t - 1 \end{cases}$

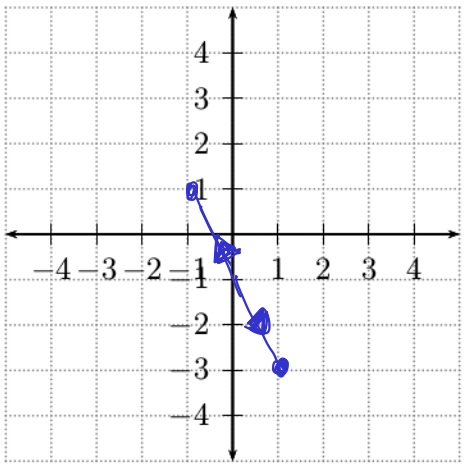
$y = -2x - 1$



parametric curves always have a direction

(b) Graph the parametric curve given by $\begin{cases} x = \cos(t) \\ y = -2\cos(t) - 1 \end{cases}$

$-1 \le x \le 1$



(c) Describe **in words** the difference(s) between the curves in parts (a) and (b).

Curve (a) has domain $-\infty < x < \infty$ and orientation from left to right. Curve (b) has domain $-1 \le x \le 1$ and the orientation oscillates back & forth between the endpoints.