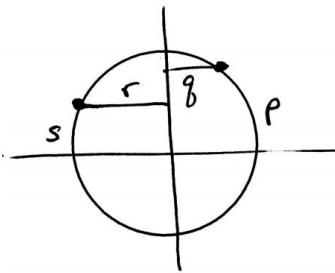


Unit 2 P.O.D.

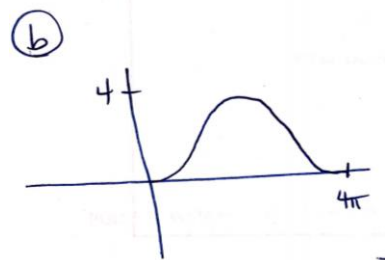
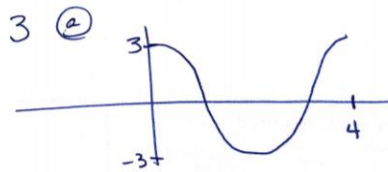
POD 2.1: Compare and contrast the graphs of  $y = -2\sin\theta$  and  $y = 0.5\sin\theta$  for  $0 \leq \theta \leq 2\pi$ . Name as many similarities/differences as you can.

POD 2.2 a.) Match the lengths,  $p, q, r, s$  marked on the unit circle in the figure with the following values

- i.)  $T = 0.8$
- ii.)  $T = \pi - 2.9$
- iii.)  $\cos(0.8)$
- iv.)  $-\cos(2.9)$



POD 2.3: Write equations for the trigonometric functions graphed below



POD 2.4: Graph  $y = \sin(x \cot x)$ . Is this function exactly the same as  $y = \cos x$ ? Why or why not?

POD 2.5: You are perched in a crow's nest,  $C$ , on top of the mast of a ship  $S$ , see the figure. You will calculate how far you can see when you are  $x$  meters above the surface of the ocean.

- (a) Find formulas for  $d$ , the distance you can see to the horizon,  $H$ , and for  $l$ , the distance to the horizon along the earth's surface, in terms of  $x$ , the height of the ship's mast, and  $r$ , the radius of the earth.
- (b) How far is the horizon from the top of a 50-meter mast? How far, measured along the earth's surface, is the horizon from the ship's position on the ocean? Use  $r = 6,370,000$  meters.

