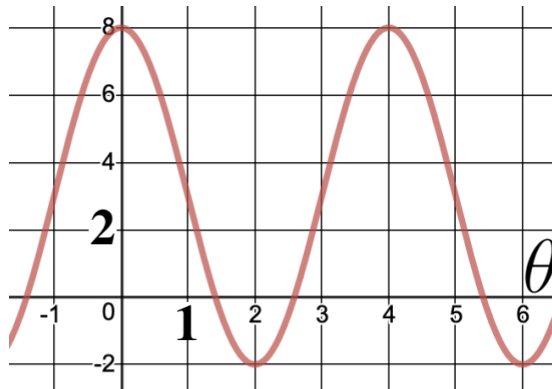


# WORKSHEET 7: 18 points

Math 6B-030, Spring 2021

Due: Friday, May 21st, 11:59pm via Gradescope

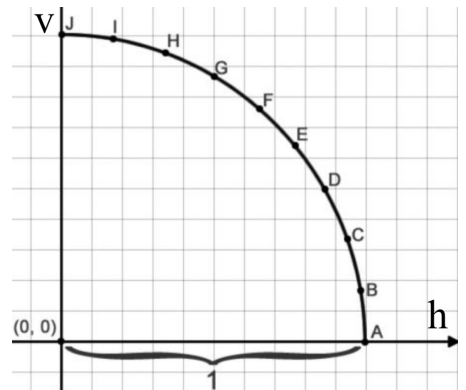
**Question 1 (5 points)** For  $f(\theta)$  depicted in the graph with  $\theta$  in radians, determine its:



- (a). (1 point) Midline (express as line): \_\_\_\_\_
- (b). (1 point) Period (include units): \_\_\_\_\_
- (c). (1 point) Amplitude: \_\_\_\_\_
- (d). (2 points)  $f(\theta) =$  \_\_\_\_\_

**Question 2 (6 points)** Consider the graph below. Assume the points on the curve are evenly spaced and so consecutive points represents  $1/9^{\text{th}}$  of a quarter circle. Consider the angle that is formed by the initial ray (from the origin to A) and the ray (from the origin) to B.

- (a). (1 point) What is the measure of this angle in radians?
- (b). (2 points) What are the coordinates,  $(h, v)$ , of point B?  
*Be precise, but do not evaluate.*
- (c). (1 point) What is the slope of this ray?  
*Be precise and do not evaluate.*
- (d). (1 point) For what angle measure  $\theta$ , in  $[0, \pi]$ , will the slope of the terminal ray be  $-1$ ?  
*Tip: It may help to draw a picture.*



- (e). (1 point) What does  $\tan\left(\frac{\pi}{9}\right)$  represent? Describe in words.

**Question 3 (5 points)** Julie gets on a ferris wheel at the 10 o'clock position. The wheel proceeds to rotate counter-clockwise, completing one rotation every 12 minutes. The ferris wheel diameter is 45 feet and the bottom of the wheel is 7 feet above the ground.

- (a). (1 point) Draw the ferris wheel and label ALL key features/lengths.
- (b). (1 point) What is the angle, in radians, from the 3 o'clock position to where Julie starts?
- (c). (1 point) How many rotations does the ferris wheel complete in: 1 minute? 2 minutes?  $t$  minutes?
- (d). (1 point) How many radians does the ferris wheel rotate in  $t$  minutes?
- (e). (1 point) Julie's height above the ground (in feet),  $H$ , is a function of the number of minutes,  $t$ , since Julie boarded the ferris wheel. Write an equation for  $H$  in terms of  $t$ .

**Question 4 (2 points)** Assume  $\theta$  is measured in radians and  $a$  is measured in degrees.

- (a). (1 point)  $g(\theta) = 7 \cos(\frac{\pi\theta}{5}) + 5$ , has midline \_\_\_\_\_, amplitude \_\_\_\_\_, period \_\_\_\_\_.
- (b). (1 point)  $h(a) = -\sin(5a)$ , has midline \_\_\_\_\_, amplitude \_\_\_\_\_, period \_\_\_\_\_.