

## Lesson 9 Practice Problems

1. Which statement is *not* true for the function  $f$  given by  $f(\theta) = \sin(\theta)$ , for values of  $\theta$  between 0 and  $2\pi$ ?

- A. The outputs of the function range from -1 to 1.
- B.  $\sin \theta = 1$  only when  $\theta = \frac{\pi}{2}$
- C.  $\sin \theta = 0$  only when  $\theta = 0$
- D.  $\sin \theta > 0$  for  $0 < \theta < \pi$

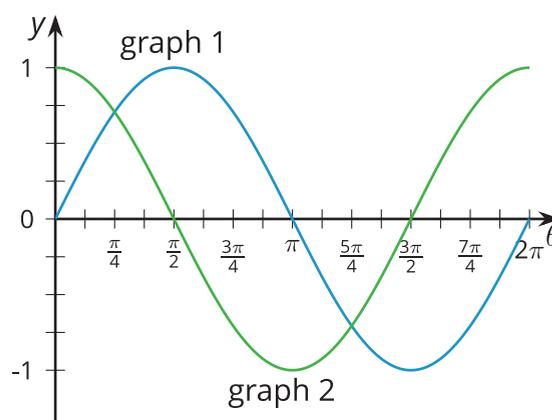
2. Angle  $\theta$ , measured in radians, satisfies  $\cos(\theta) = 0$ . What could the value of  $\theta$  be? Select **all** that apply.

- A. 0
- B.  $\frac{\pi}{4}$
- C.  $\frac{\pi}{2}$
- D.  $\pi$
- E.  $\frac{3\pi}{2}$

3. Here are the graphs of two functions.

- a. Which is the graph of  $y = \cos(\theta)$ ? Explain how you know.

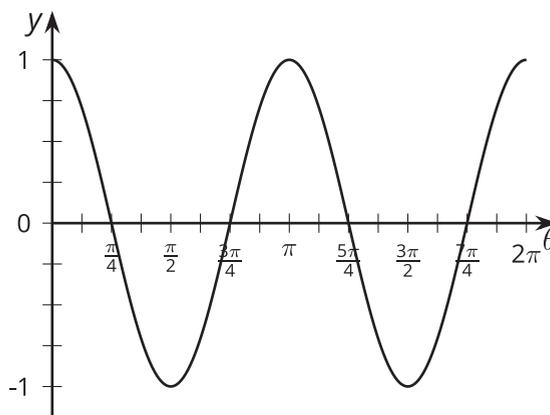
- b. Which is the graph of  $y = \sin(\theta)$ ? Explain how you know.



4. Which statements are true for *both* functions  $y = \cos(\theta)$  and  $y = \sin(\theta)$ ? Select all that apply.

- A. The function is periodic.
- B. The maximum value is 1.
- C. The maximum value occurs at  $\theta = 0$ .
- D. The period of the function is  $2\pi$ .
- E. The function has a value of about 0.71 when  $\theta = \frac{\pi}{4}$ .
- F. The function has a value of about 0.71 when  $\theta = \frac{3\pi}{4}$ .

5. Here is a graph of a function  $f$ .



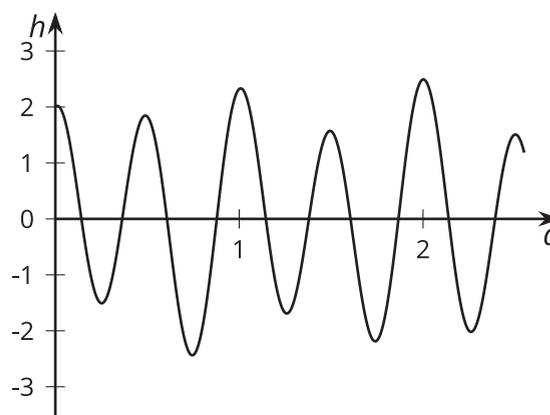
The function  $f$  is either defined by  $f(\theta) = \cos^2(\theta) + \sin^2(\theta)$  or  $f(\theta) = \cos^2(\theta) - \sin^2(\theta)$ . Which definition is correct? Explain how you know.

6. The minute hand on a clock is 1.5 feet long. The end of the minute hand is 6 feet above the ground at one time each hour. How many feet above the ground could the center of the clock be? Select **all** that apply.

- A. 4.5
- B. 5
- C. 6
- D. 7
- E. 7.5

(From Unit 6, Lesson 7.)

7. Here is a graph of the water level height,  $h$ , in feet, relative to a fixed mark, measured at a beach over several days,  $d$ .



- a. Explain why the water level is a function of time.
- b. Describe how the water level varies each day.
- c. What does it mean in this context for the water level to be a periodic function of time?

(From Unit 6, Lesson 8.)