

# Unit 10

## Test Review Graphing and Modeling Sine and Cosine 2023-2024

SCORE:

/

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Fill in the blanks for each equation.

1.  $f(\theta) = 6 - 5 \cos \frac{\theta}{4}$

Vertical Shift (d): \_\_\_\_\_

Amplitude (a): \_\_\_\_\_

Phase Shift (c): \_\_\_\_\_

b: \_\_\_\_\_

Period: \_\_\_\_\_

2.  $f(\theta) = -\sin\left(\theta + \frac{\pi}{4}\right)$

Vertical Shift (d): \_\_\_\_\_

Amplitude (a): \_\_\_\_\_

Phase Shift (c): \_\_\_\_\_

b: \_\_\_\_\_

Period: \_\_\_\_\_

Fill in the vertical shift, amplitude, phase shift, and period. Then graph at least 1 period or cycle. Label 5 key points or make a table of the key points.

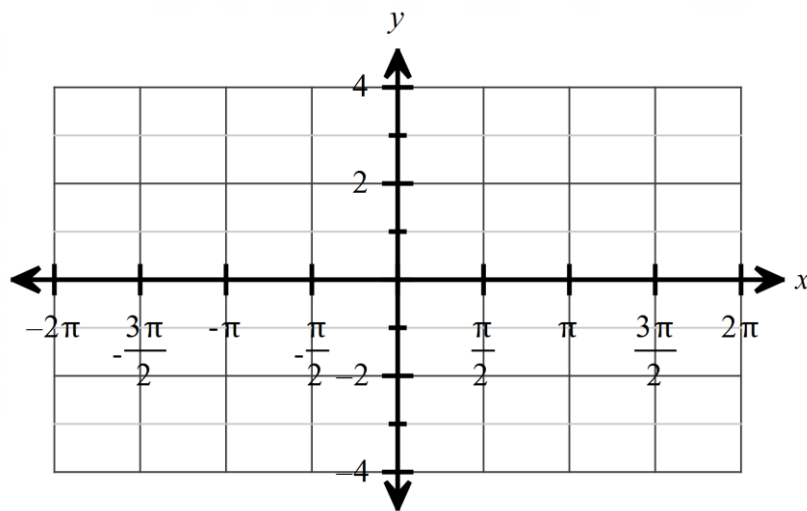
3.  $f(\theta) = -1 + 3 \cos 2\left(\theta + \frac{\pi}{2}\right)$

Vertical Shift (d): \_\_\_\_\_

Amplitude (a): \_\_\_\_\_

Phase Shift (c): \_\_\_\_\_

Period: \_\_\_\_\_



$\theta$					
$y = \cos \theta$					

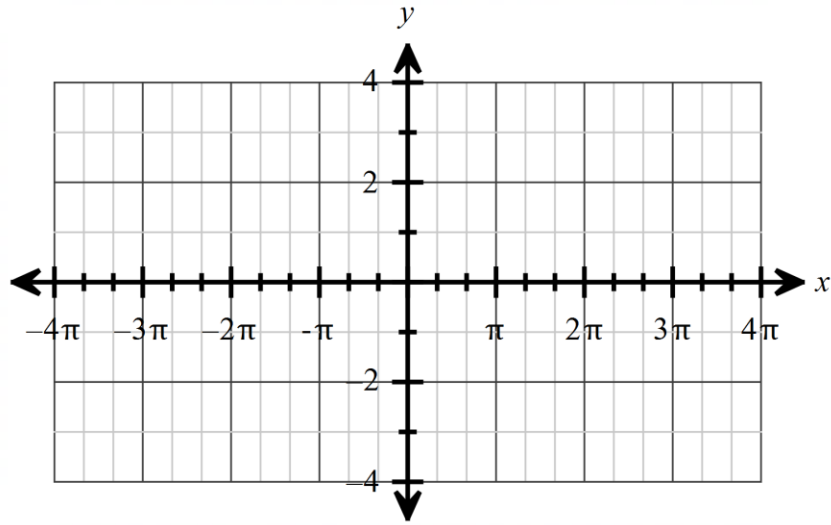
4.  $f(\theta) = 2 \cos 3(\theta - \pi)$

Vertical Shift (d): \_\_\_\_\_

Amplitude (a): \_\_\_\_\_

Phase Shift (c): \_\_\_\_\_

Period: \_\_\_\_\_



$\theta$					
$y = \cos \theta$					

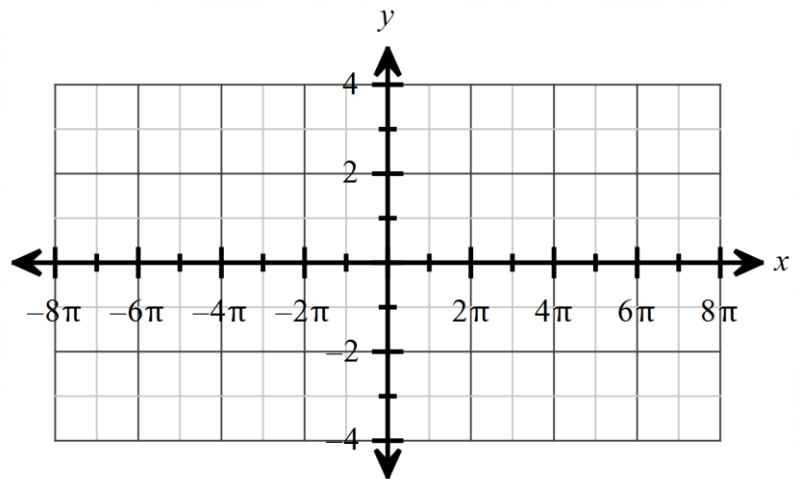
5.  $f(\theta) = 2 \sin\left(\frac{\theta}{3}\right) - 2$

Vertical Shift (d): \_\_\_\_\_

Amplitude (a): \_\_\_\_\_

Phase Shift (c): \_\_\_\_\_

Period: \_\_\_\_\_



$\theta$					
$y = \sin \theta$					

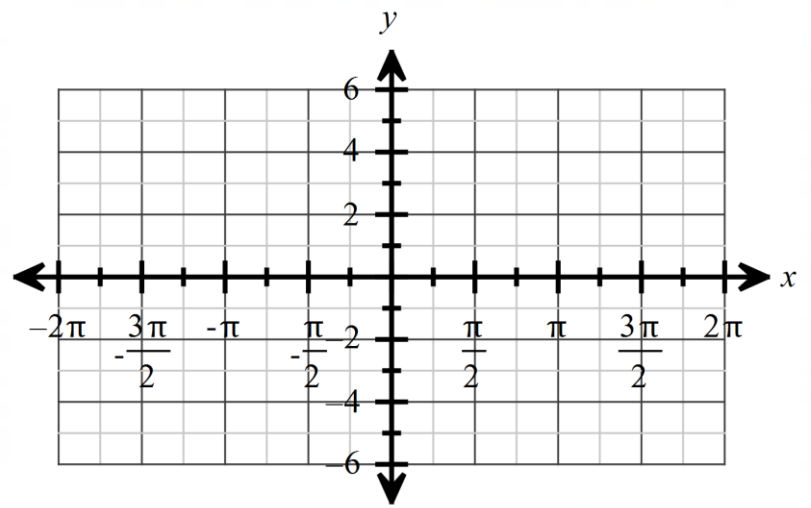
6.  $f(\theta) = 2 - 3 \sin \theta$

Vertical Shift (d): \_\_\_\_\_

Amplitude (a): \_\_\_\_\_

Phase Shift (c): \_\_\_\_\_

Period: \_\_\_\_\_



$\theta$					
$y = \sin \theta$					

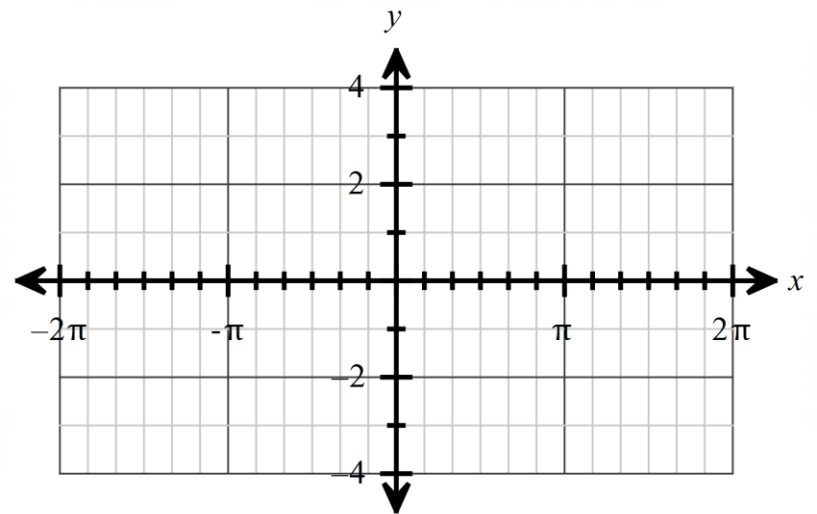
7.  $f(\theta) = -2 \cos \left( \theta - \frac{\pi}{6} \right)$

Vertical Shift (d): \_\_\_\_\_

Amplitude (a): \_\_\_\_\_

Phase Shift (c): \_\_\_\_\_

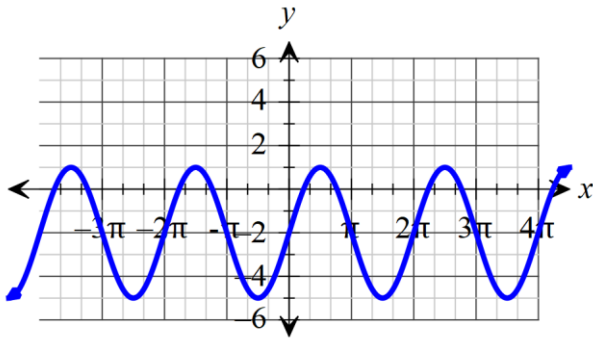
Period: \_\_\_\_\_



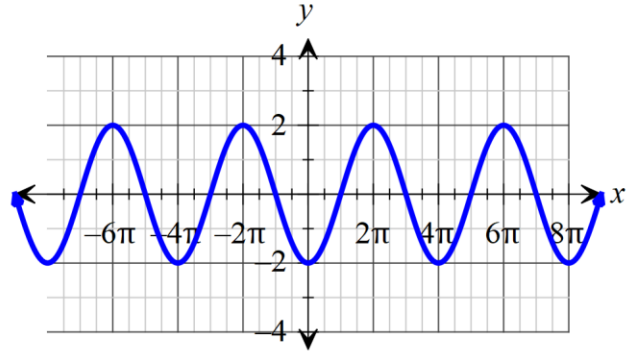
$\theta$					
$y = \cos \theta$					

Write the sine or cosine equation to represent each graph.

8.  $\sin(\theta)$



9.  $\cos(\theta)$



Write the **cosine** equation that has the given information.

10. Amplitude = 2, Period =  $2\pi$ , Vertical Shift = 24

11. Amplitude = 1, Phase Shift =  $\pi$  Period =  $\frac{\pi}{2}$

Write the **sine** equation that has the given information.

12. Amplitude = 3, Period =  $\pi$ , Vertical Shift = 10

13. Amplitude = 7, Phase Shift = 0 Period =  $\frac{\pi}{4}$

Read each story and write the appropriate trigonometric function to model each periodic situation below.

14. A buoy oscillates up and down as waves go past. The buoy moves a total of 4 feet from its low point to its high point, and then returns to its high point every 6 seconds. Write a sine function modeling the buoy's vertical position at any time  $t$ .

15. A Ferris wheel 100 feet in diameter makes one revolution every 80 seconds. The center of the wheel is 60 above the ground. People load at the bottom of the Ferris wheel. Write a cosine function to model the height of a car on the Ferris wheel at any time  $t$ .

16. In Lima, Peru the average monthly temperature is the highest in January and the lowest in July. It ranges from  $82^{\circ}\text{F}$  to  $58^{\circ}\text{F}$ . Write a cosine function that models the change in temperature according to the month of the year.

17. Low tide is at 6:45 am and high tide is at 12:45 pm. The water level varies 96 inches between low and high tide. Write a cosine function to represent the change in water level.

18. The highest pitch a dog can easily hear has a frequency of 65,000 cycles per second. Write a sine function representing the sound wave of the pitch. (Amplitude is 1.)