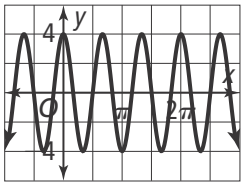
7-4 Additional Practice

Graphing Sine and Cosine Functions

Identify the domain, range, and period of the functions below.

1. $y = 4 \cos 3\theta$

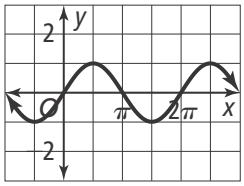


Domain: _____

Range: _____

Period: _____

2. $y = \sin \theta$



Domain: _____

Range: _____

Period: _____

What are the amplitude and period of each function?

3. $y = 4 \sin 5\theta$

4. $y = 3 \cos 4\theta$

Use a graphing calculator to graph the functions shown. What is the frequency? What is the average rate of change over the interval $\left[0, \frac{\pi}{4}\right]$?

5. $y = 3 \sin 6\theta$

Frequency: _____

Average rate of change: _____

6. $y = 5 \cos 2\theta$

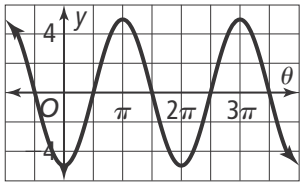
Frequency: _____

Average rate of change: _____

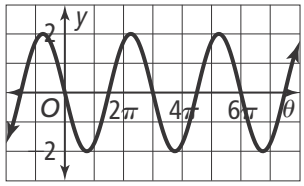
7. A helicopter lowers a rope ladder to a scuba diver floating on the ocean's surface. The waves crest at 4 ft above the lowest level of the water every 8 s. Write a cosine equation to describe the height of the diver as a function of time t.

What equation represents the graphs?

8.



9.



10. Describe and correct the error a student made in creating an equation with the given information: $y = 2 \sin 4\theta$, a period of 4π, and amplitude of 2.

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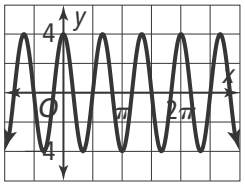
1. $y = 4 \cos 3\theta$

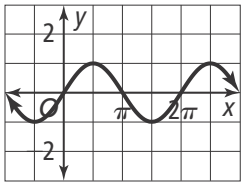


Domain: $\infty < x < \infty$

Range: $-4 \leq y \leq 4$

Period: $\frac{2\pi}{3}$

2. $y = \sin \theta$



Domain: $-\infty < x < \infty$

Range: $-1 \leq y \leq 1$

Period: 2π

What are the amplitude and period of each function?

3. $y = 4 \sin 5\theta$ $4; \frac{2\pi}{5}$

4. $y = 3 \cos 4\theta$ $3; \frac{\pi}{2}$

Use a graphing calculator to graph the functions shown. What is the frequency? What is the average rate of change over the interval $\left[0, \frac{\pi}{4}\right]$?

5. $y = 3 \sin 6\theta$

Frequency: 6

Average rate of change: $-\frac{12}{\pi}$

6. $y = 5 \cos 2\theta$

Frequency: 2

Average rate of change: $\frac{20}{\pi}$

7. A helicopter lowers a rope ladder to a scuba diver floating on the ocean's surface. The waves crest at 4 ft above the lowest level of the water every 8 s. Write a cosine equation to describe the height of the diver as a function of time t. $y = 2 \cos \frac{\pi}{4}\theta$

What equation represents the graphs?

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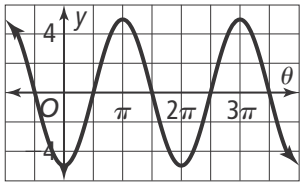
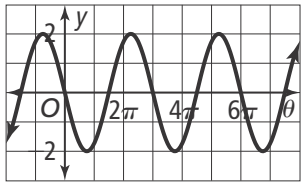


$y = -5 \cos \theta$

9.



$y = -2 \sin \frac{2}{3}\theta$

10. Describe and correct the error a student made in creating an equation with the given information: $y = 2 \sin 4\theta$, a period of 4π, and amplitude of 2.

$y = 2 \sin \frac{1}{2}\theta$; Sample answer: The student did not use the proper formula to find the frequency.