

Unit 5 Test Study Guide

1. Explain the following concepts in full-length sentences. Provide convincing arguments:

A.) Describe why amplitude is always positive.

B.) Describe what is true about the domain of all sine and cosine functions, regardless of their transformations.

C.) Describe what properties of trigonometric functions affect the range.

2. Exploring the relationships between midline, maximums, minimums, range, and amplitude:

A.) If the midline of a trigonometric function is located at $y = 4$ and the amplitude is 5, determine the following:

Maximum _____

Minimum _____

Range _____

B.) If the range of a trigonometric function is $-1 \leq y \leq 13$, determine the following:

Maximum _____

Minimum _____

Midline _____

Amplitude _____

3. Write a trigonometric function that has the following properties:

A.) Sine function with a midline at $y = 7$ and a period of 2π .

B.) Cosine function that has a range of $-3 \leq y \leq 5$, is vertically stretched by 3, and is reflected over its midline.

C.) Sine function that has an amplitude of $\frac{1}{2}$, a period of 4π and a midline located at $y = 1$.

4. Determine the following properties from the trigonometric function:

A.) $y = \frac{1}{2} \sin(8x - 4\pi) - 1$

B.) $y = -4 \cos\left(\frac{1}{3}x + 6\pi\right) + 2$

Amplitude:

Amplitude:

Midline:

Midline:

Period:

Period:

Phase Shift:

Phase Shift:

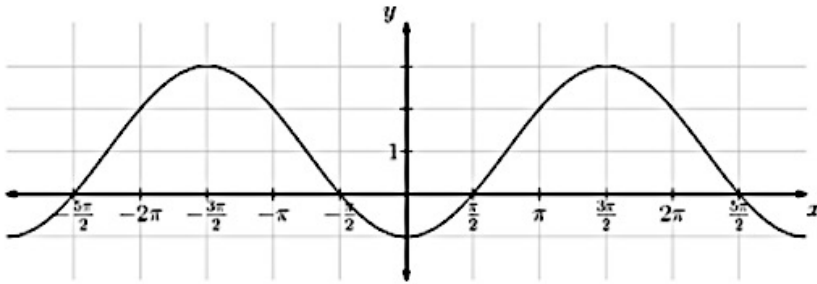
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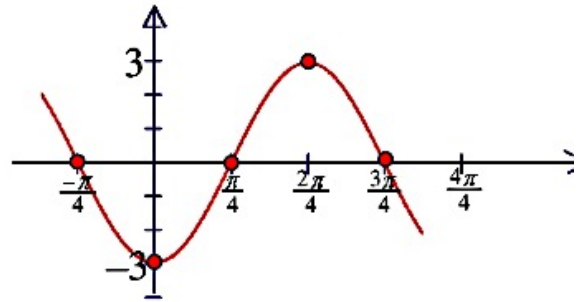
Range:

Range:

5. Write an equation for a cosine function.



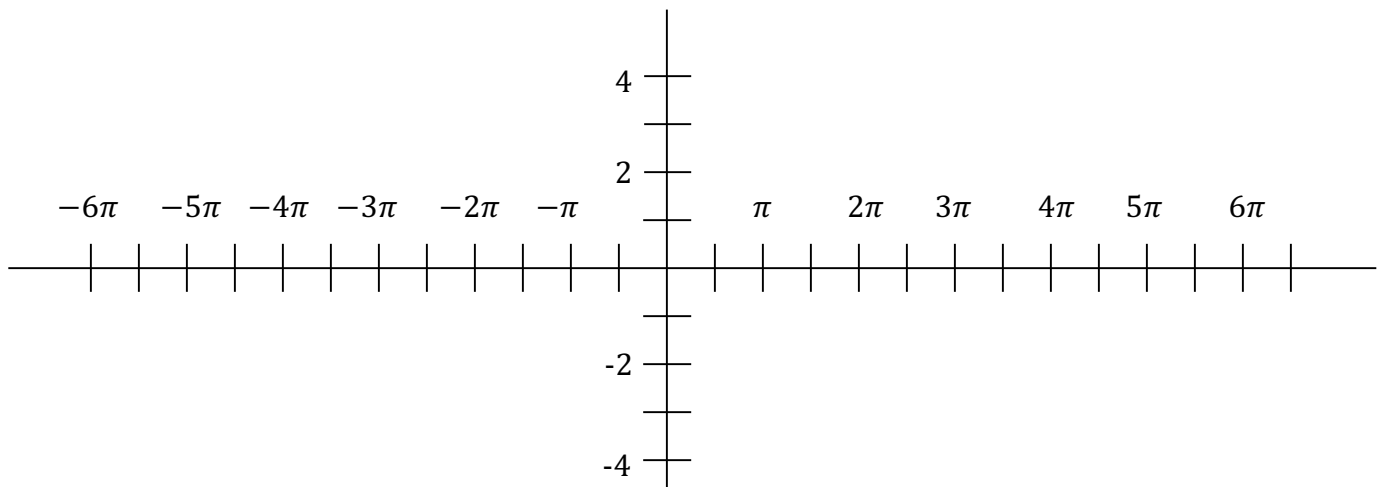
6. Write an equation for a sine function.



7. Graph the following trigonometric functions on the coordinate planes provided:

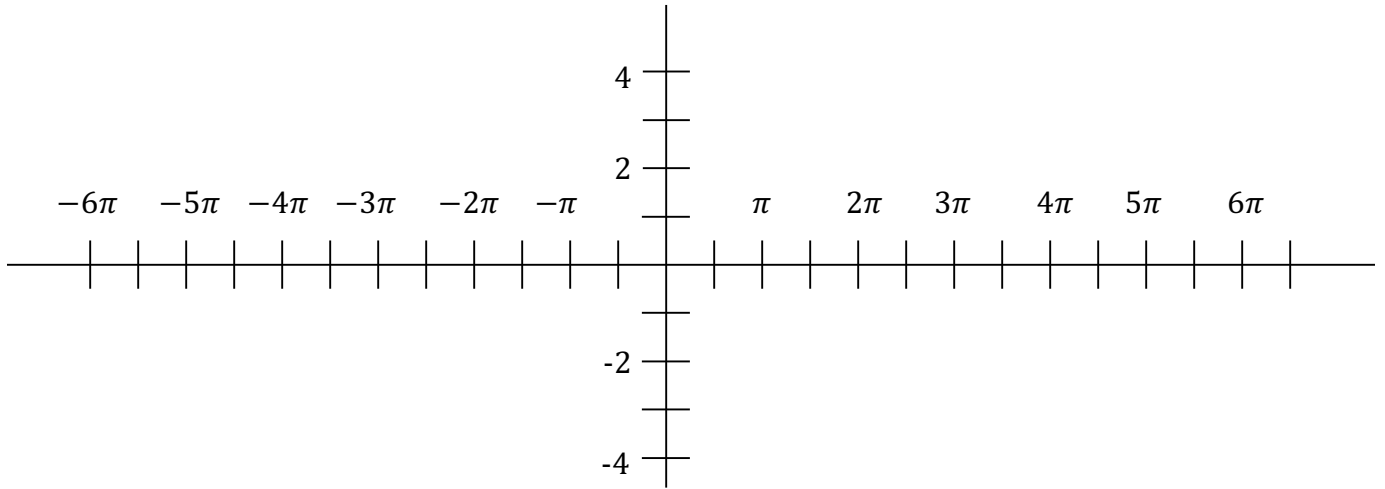
A.) $y = \sin(x) + 1$

Amplitude: _____ Period: _____ Midline: _____ Domain: _____ Range: _____



B.) $y = -3\cos\left(\frac{1}{2}x\right) + 2$

Amplitude: _____ Period: _____ Midline: _____ Domain: _____ Range: _____



8. The time for one cycle is approximately 7 hours. The high-tide depth of 16 feet occurs at noon and the average harbor depth is 11 feet.

(A.) Write an equation modeling this relationship. (B.) What time will the river harbor be low tide?