

Lesson 5: Graphing Sine and Cosine

Question #1

Reference Q.12447

Describe how the graph of the given function compares to the graph of $y = \cos x$.

- a. $y = 5 \cos x$
- b. $y = 2 \cos \frac{1}{2}x$
- c. $y = -\frac{1}{3} \cos 4x$
- d. $y = 0.2 \cos(-6x)$

Question #2

Reference Q.12448

State the amplitude

- a. $y = 5 \sin x$
- b. $y = \cos 3x$
- c. $y = \frac{7}{3} \sin 2x$
- d. $y = -4 \cos \frac{5}{6}\theta$

Question #3

Reference Q.12449

State the period in degrees.

- a. $y = 6 \sin x$
- b. $y = \frac{2}{3} \cos \frac{x}{7}$

Question #4

Reference Q.12450

State the period in radians.

- a. $y = \cos 3x$
- b. $y = \frac{1}{4} \sin \frac{x}{3}$

Question #5

Reference Q.12451

Write the equation of a sine function with the given amplitude and period.

- a. amplitude 2, period 1080°
- b. amplitude 8, period $\frac{\pi}{4}$
- c. amplitude $\frac{3}{2}$, period 6π

Question #6

Reference Q.12452

Write the equation of a cosine function with the given amplitude and period.

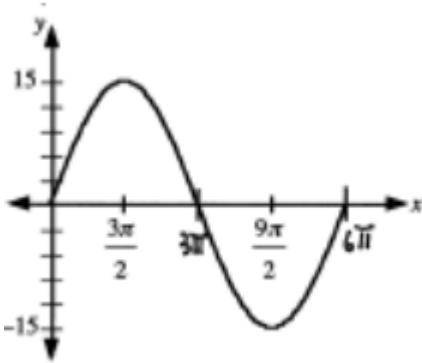
- a. amplitude 1, period 180°
- b. amplitude 5, period $\frac{4\pi}{3}$
- c. amplitude $\frac{5}{3}$, period 3π

Question #7

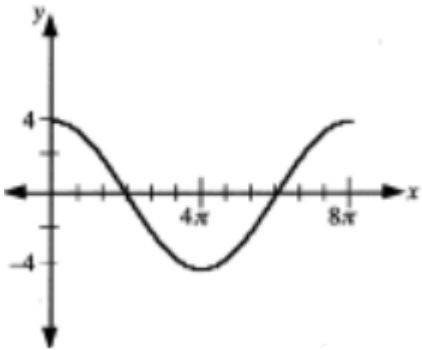
Reference Q.12454

Determine the equation of each graph in the form.

a. $y = a \sin bx$



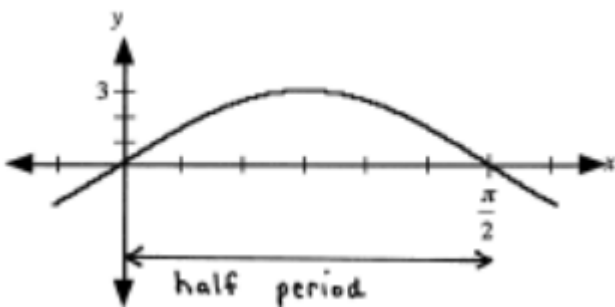
b. $y = a \cos bx$



Question #8

Reference Q.12455

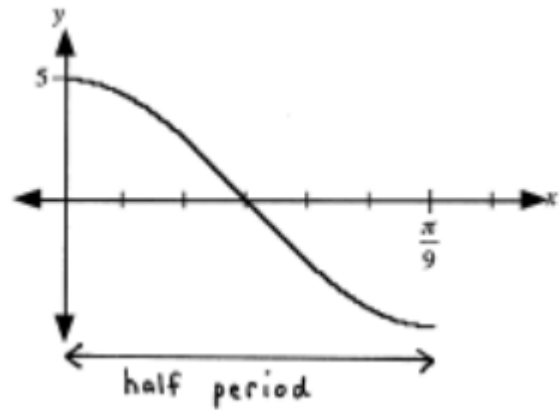
The trigonometric graph shown has a maximum value of 3 and a minimum value of -3 . Determine the equation of the graph in the form $y = a \sin bx$.



Question #9

Reference Q.12456

The trigonometric graph shown has a maximum value of 5 and a minimum value of -5 . Determine the equation of the graph in the form $y = a \cos bx$.



Question #10

Reference Q.12457

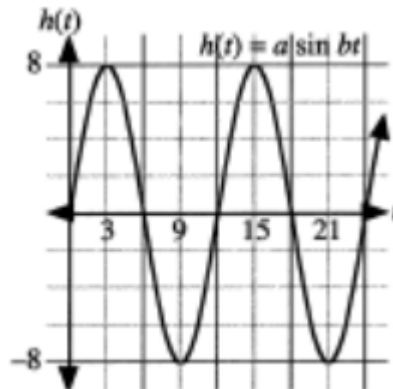
Consider the graph of $y = 3 \cos \frac{x}{2}$, $0 \leq x \leq 2\pi$.

- State the amplitude and period.
- Sketch the graph on the grid. Use a graphing calculator to verify.

Question #11

Reference Q.12458

The graph represents the change in sea level over a 24 hour period. The graph has equation $h(t) = a \sin bt$, where t is in hours and h is the height, in metres, relative to mean sea level.

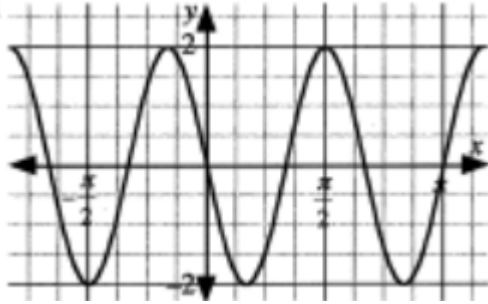


- Determine the equation of the graph.
- Calculate the height above mean sea level, to the nearest tenth, when $t = 4$.

Question #12

Reference Q.12459

- a. Which transformations applied to the graph of $y = \sin x$ result in the graph shown?



- b. Write the equation of the graph in the form $y = a \sin bx$.

Question #13

Reference Q.12463

Determine the amplitude, period, horizontal phase shift, and the vertical displacement for each function.

- $y = \cos\left(x - \frac{\pi}{4}\right) + 3$
- $y = 3 \cos \frac{1}{2}\left(x - \frac{\pi}{2}\right)$
- $y = 3 \cos \frac{1}{2}x - \frac{\pi}{2}$
- $y = \sin\left(4x - \frac{\pi}{2}\right)$
- $y = -2 \cos 3(x - 45^\circ) + 4$
- $y = 7 \sin\left(\frac{1}{4}x + 20^\circ\right) - 1$

Question #14

Reference Q.12464

- Determine the equation of a sine function that has a vertical displacement 3 units up, a horizontal phase shift of 60° to the left, a period of 210° and an amplitude of 4.
- Determine the equation of a cosine function with a vertical displacement 5 units down, a horizontal phase shift of $\frac{2\pi}{3}$ radians to the right, a period of $\frac{5\pi}{4}$ and an amplitude of 3.

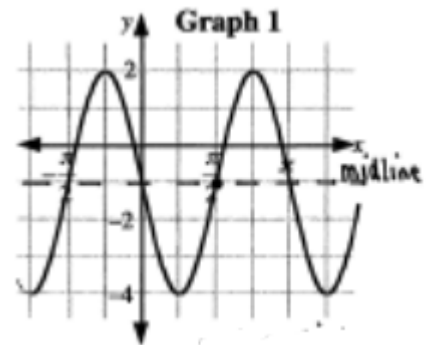
Question #15

Reference Q.12465

Graph 1 and 2 each represent the graphs of trigonometric functions.

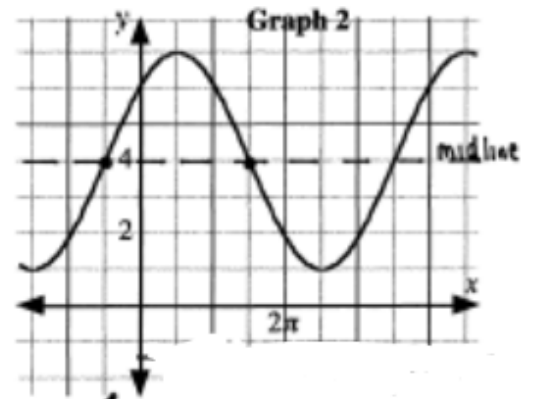
- a. Assuming a minimum possible phase shift, write the equation of each graph in the form $y = a \sin[b(x - c)] + d$ if

- $a > 0$
- $a < 0$



ii.

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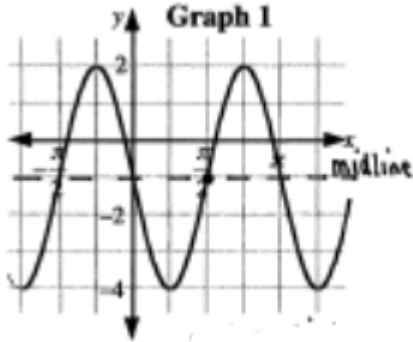


iii.

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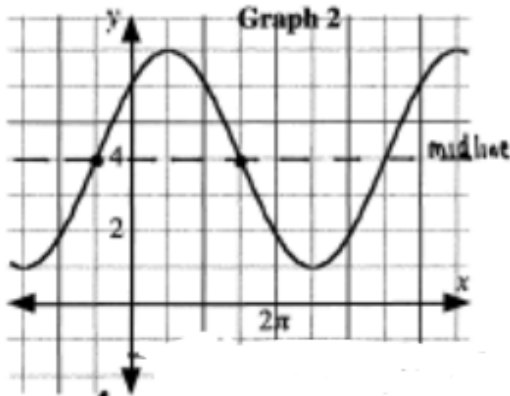
b. Assuming a minimum possible phase shift, write the equation of each graph in the form $y = a \cos[b(x - c)] + d$ if

- 1) $a > 0$
- 2) $a < 0$



iii.

- 3.
- 4.



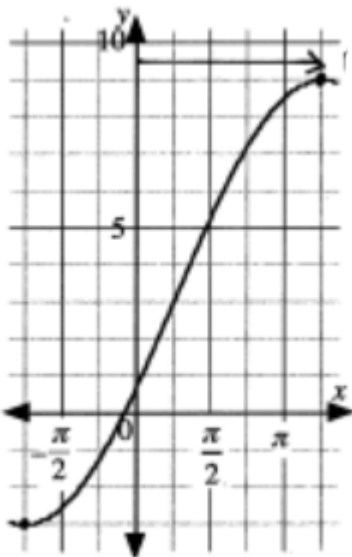
iv.

- 3.
- 4.

Question #16

Reference Q.12466

The cosine graph shown has a range $-3 \leq y \leq 9$. The graph has an equation in the form $y = a \cos[b(x - c)] + d, a > 0$.

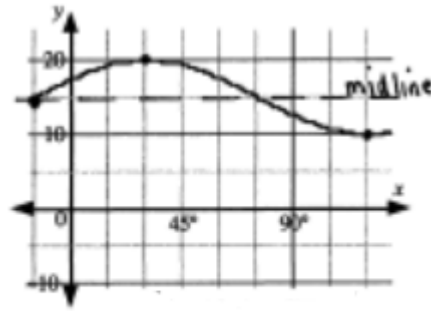


Determine the equation if the graph has a minimum possible phase shift.

Question #17

Reference Q.12467

The sine graph shown has a maximum value of 20 and a minimum value of 10. If the graph has a minimum possible phase shift, determine the equation of the graph in the form $y = a \sin[b(x - c)] + d$ with $a > 0$.



Question #18

Reference Q.12469

Determine the range of the functions represented below.

- a. $y = 2 \sin x - 2$
- b. $y = 3 \cos \frac{1}{2} \left(x - \frac{\pi}{2} \right) + 1$
- c. $y = -\frac{1}{2} \cos 4(x - \pi) - 3$
- d. $y = a \sin[b(x - c)] + d$, where $a > 0$

Question #19

Reference Q.12470

Which of the following graphs has the same x-intercepts as the graph of $y = \cos x$?

- A. $y = \cos 4x$
- B. $y = 4 \cos x$
- C. $y = \cos x + 4$
- D. $y = \cos(x + 4)$

Question #20

Reference Q.12472

The equation $y = \pi \cos(\pi x - \pi)$ has a period and a horizontal phase shift to the right, respectively, of

- A. π and π
- B. π and 1
- C. 2 and π
- D. 2 and 1

🔍 **Question #21**

Reference Q.12473

Which statement concerning the graph of $y = -4 \cos \frac{x}{2} + 2$ is not correct?

- A. The maximum value is 6
- B. The period is 4π
- C. The amplitude is -4 .
- D. The vertical displacement is 2

🔍 **Question #22**

Reference Q.12474

The period to the nearest tenth, of the function $y = \sin 0.25x$, where x is in radians, is ____.