

Algebra 2 · Graphs of Trigonometric Functions

· Quiz

Common Core F-TF.B.5, F-IF.C.7e · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

Answer these 10 multiple-choice questions on graphs of sine and cosine. They cover amplitude, period, midline, phase shift, reading graphs and periodic models. Choose one answer for each question, then check the explanations.

Algebra 2 Common Core: **F-TF.B.5 · F-IF.C.7e**

Questions

Question 1

What is the amplitude of $y = -5\sin x + 2$?

- A. -5
- B. 2
- C. 7
- D. 5

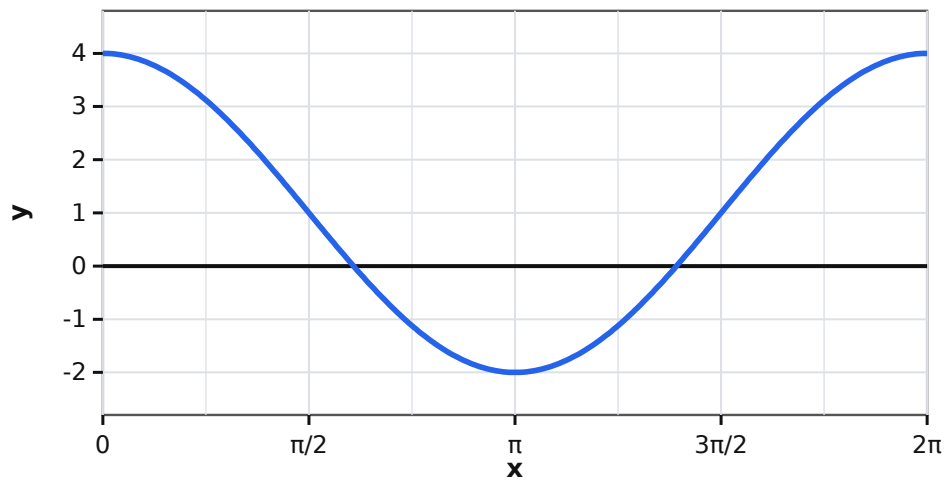
Question 2

What is the period of $y = \cos(3x)$?

- A. 6π
- B. 2π
- C. $\frac{2\pi}{3}$
- D. $\frac{\pi}{3}$

Question 3

Which equation matches the graph?



Graph for quiz question 3.

- A. $y = 3\sin x + 1$
- B. $y = 3\cos x + 1$
- C. $y = 4\cos x - 2$
- D. $y = \cos(3x) + 1$

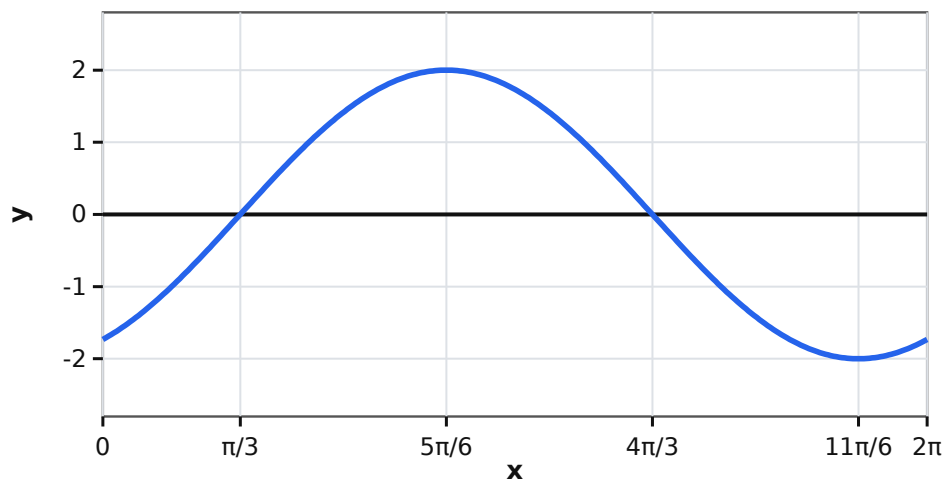
Question 4

What is the midline of $y = 4\sin x - 3$?

- A. $y = 3$
- B. $y = -3$
- C. $y = 4$
- D. $y = -4$

Question 5

Which equation matches the graph?



Graph for quiz question 5.

- A. $y = 2\sin\left(x + \frac{\pi}{3}\right)$
- B. $y = 2\sin x - \frac{\pi}{3}$
- C. $y = 2\sin\left(x - \frac{\pi}{3}\right)$
- D. $y = 2\cos\left(x - \frac{\pi}{3}\right)$

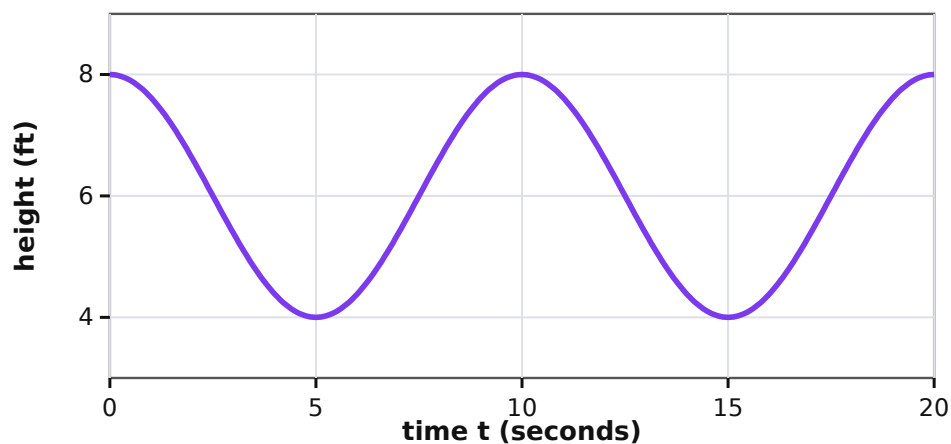
Question 6

What is the range of $y = -2\cos x + 3$?

- A. $[1, 5]$
- B. $[-5, -1]$
- C. $[-2, 2]$
- D. $[3, 5]$

Question 7

The graph shows the height of a water wheel paddle. What is the period?



Graph for quiz question 7.

- A. 10 seconds
- B. 5 seconds
- C. 20 seconds
- D. 4 seconds

Question 8

A sine wave $y = \sin(Bx)$ has period 8. What is B ?

- A. 8π
- B. $\frac{\pi}{8}$
- C. $\frac{\pi}{2}$
- D. $\frac{\pi}{4}$

Question 9

What is $f\left(\frac{3\pi}{2}\right)$ for $f(x) = 2\sin x - 1$?

- A. -3
- B. 1
- C. -1
- D. -2

Question 10

A model is $h(t) = 12 + 8\cos\left(\frac{\pi t}{5}\right)$. What is the minimum height?

- A. 8
- B. 4
- C. 12
- D. 20

Answer key

1. **D** - Amplitude is $|A| = |-5| = 5$. A negative sign flips the wave but never makes the amplitude negative.
2. **C** - Period $= \frac{2\pi}{B} = \frac{2\pi}{3}$. Multiplying 2π by 3 is a common mistake.
3. **B** - The midline is $y = 1$ and the amplitude is 3. The wave starts at its maximum, so it is cosine.
4. **B** - The midline is $y = D$, here $D = -3$. The amplitude 4 is not the midline.
5. **C** - The wave crosses zero going up at $x = \frac{\pi}{3}$, so it is shifted right by $\frac{\pi}{3}$. A plus sign shifts left.
6. **A** - Midline 3, amplitude 2: the range is $[3-2, 3+2] = [1, 5]$.
7. **A** - Two consecutive maxima occur at $t = 0$ and $t = 10$, so one cycle takes 10 seconds. The 5 is only half a cycle.
8. **D** - Period $= \frac{2\pi}{B} = 8$, so $B = \frac{2\pi}{8} = \frac{\pi}{4}$.
9. **A** - $\sin \frac{3\pi}{2} = -1$, so $2(-1) - 1 = -3$. Using $\sin \frac{3\pi}{2} = 1$ gives 1.
10. **B** - Minimum $= D - |A| = 12 - 8 = 4$. The value 20 is the maximum.

Remember:

- Standards F-TF.B.5 and F-IF.C.7e: graph sine and cosine and use them to model periodic phenomena.
- Parent functions have amplitude 1, period 2π , midline $y = 0$ and range $[-1, 1]$.
- Period is $\frac{2\pi}{B}$: a larger B squeezes the wave horizontally.
- Maximum $= D + |A|$ and minimum $= D - |A|$, so $D = \frac{\max + \min}{2}$.
- To model a situation, match the radius or half-range to A , the center to D and the time per cycle to the period.