

Algebra 2 - Graphs of Trigonometric Functions and Identities - Quiz

Common Core F-TF.B.5, F-TF.C.8, F-IF.C.7e · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Answer ten multiple-choice questions on graphs of trigonometric functions and the Pythagorean identity. Choose one option for each question, then read the explanation to see why the correct choice works and which mistake, such as using B instead of $2\pi/B$ for the period, each wrong choice shows.

Algebra 2 · Common Core State Standards: **F-TF.B.5, F-TF.C.8, F-IF.C.7e**

Questions

Question 1

What is the amplitude of $y = -6\sin x$?

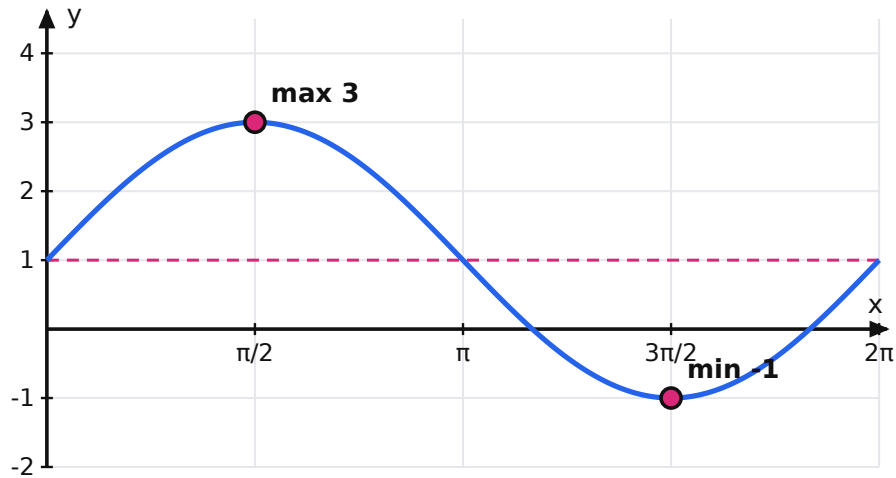
- A. -6
- B. 6
- C. 12
- D. 2π

Question 2

What is the period of $y = \sin(6x)$?

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

Question 3



$y = 2 \sin x + 1$: midline $y = 1$, amplitude 2, period 2π .

What is the midline of the graph?

- A. $y = 0$
- B. $y = 1$
- C. $y = 2$
- D. $y = 3$

Question 4

What is the maximum of $y = 3 \cos x + 4$?

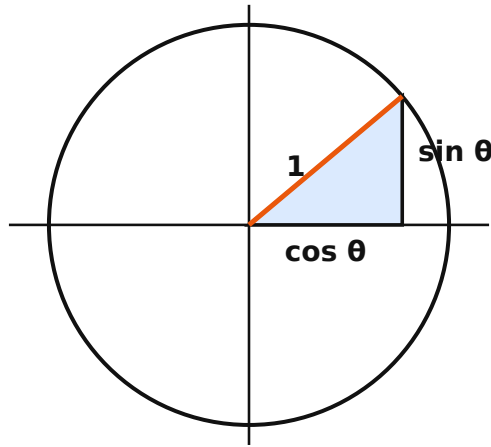
- A. 3
- B. 12
- C. 7
- D. 1

Question 5

Which identity is always true?

- A. $\sin^2 x + \cos^2 x = 1$
- B. $\sin x + \cos x = 1$
- C. $\sin^2 x - \cos^2 x = 1$
- D. $\sin x \cos x = 1$

Question 6



The right triangle in the unit circle: $\cos^2 \theta + \sin^2 \theta = 1$.

If $\sin \theta = 4/5$ and θ is in quadrant I, what is $\cos \theta$?

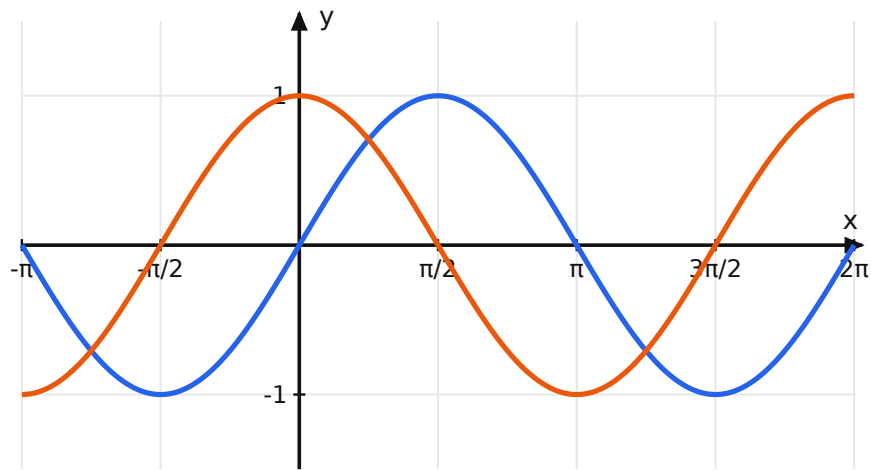
- A. $-\frac{3}{5}$
- B. $\frac{1}{5}$
- C. $\frac{3}{5}$
- D. $\frac{9}{25}$

Question 7

Which function has amplitude 2, midline $y = 5$, and period 2π , starting at its maximum?

- A. $y = 5\cos x + 2$
- B. $y = 2\sin x + 5$
- C. $y = 2\cos(2x) + 5$
- D. $y = 2\cos x + 5$

Question 8



$y = \sin x$ (blue) and $y = \cos x$ (orange) both have period 2π and amplitude 1.

How is the graph of cosine related to the graph of sine?

- A. Cosine is sine shifted right by π
- B. Cosine is sine reflected over the x-axis
- C. They are the same graph
- D. Cosine is sine shifted left by $\pi/2$

Question 9

If $\cos\theta = -\frac{8}{17}$ and θ is in quadrant II, what is $\sin\theta$?

- A. $\frac{15}{17}$
- B. $-\frac{15}{17}$
- C. $\frac{9}{17}$
- D. $\frac{8}{15}$

Question 10

The tide height is $y = 2\sin\left(\frac{\pi}{6}t\right) + 7$. What is the high-tide height?

- A. 7 feet
- B. 9 feet
- C. 2 feet
- D. 14 feet

Answers

1. **B** - Amplitude is the absolute value of A, so 6. The negative sign reflects the graph but does not change the amplitude.
2. **A** - Period = $2\pi / 6 = \pi/3$.
3. **B** - The midline is halfway between the maximum 3 and the minimum -1, so $y = 1$.
4. **C** - Maximum = midline + amplitude = $4 + 3 = 7$.
5. **A** - The Pythagorean identity follows from the unit circle having radius 1.
6. **C** - $\cos^2 \theta = 1 - 16/25 = 9/25$, and cosine is positive in quadrant I, so $\cos \theta = 3/5$.
7. **D** - Cosine starts at its maximum; $A = 2$ and $D = 5$; $B = 1$ gives period 2π .
8. **D** - $\cos x = \sin(x + \pi/2)$, a left shift of $\pi/2$.
9. **A** - $\sin^2 \theta = 1 - 64/289 = 225/289$; sine is positive in quadrant II.
10. **B** - Maximum = midline + amplitude = $7 + 2 = 9$.

Remember

- Sine and cosine have period 2π and range -1 to 1.
- $y = A \sin(B(x - C)) + D$: amplitude $|A|$, period $2\pi/B$, shift C, midline D.
- Model cycles with a sinusoid: midline = average of max and min.
- $\sin^2 \theta + \cos^2 \theta = 1$.
- The quadrant gives the sign of the missing trig value.