

Precalculus - Graphs of Trigonometric Functions - Quiz

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

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

Pick the best answer for 10 questions on sine, cosine and tangent graphs. Explanations name common slips, such as confusing amplitude with the maximum value.

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

Questions

Question 1

What is the amplitude of $y = -7\cos x$?

- A. 7
- B. -7
- C. 1
- D. 2π

Question 2

What is the period of $y = \cos 4x$?

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

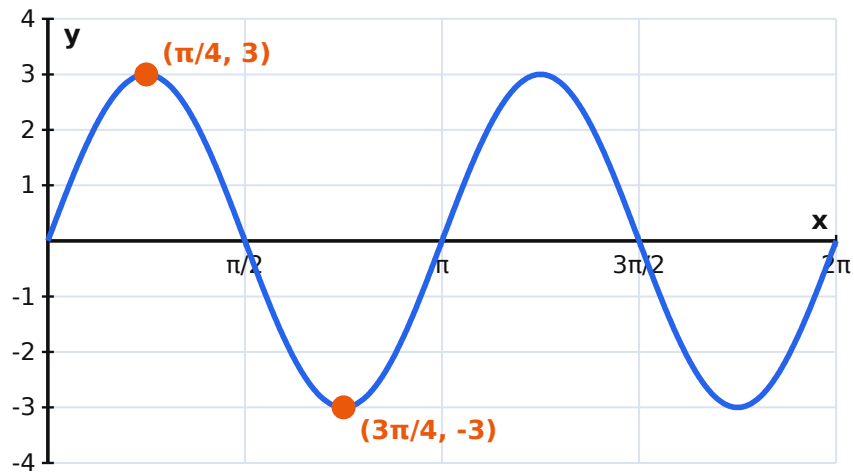
Question 3

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

- A. $y = 5$
- B. $y = 2$
- C. $y = 7$
- D. $y = 0$

Question 4

The graph shows one cycle of which function?



Graph with max 3 at $\pi/4$.

- A. $y = 3\sin x$
- B. $y = 3\sin 2x$
- C. $y = 2\sin 3x$
- D. $y = 3\cos 2x$

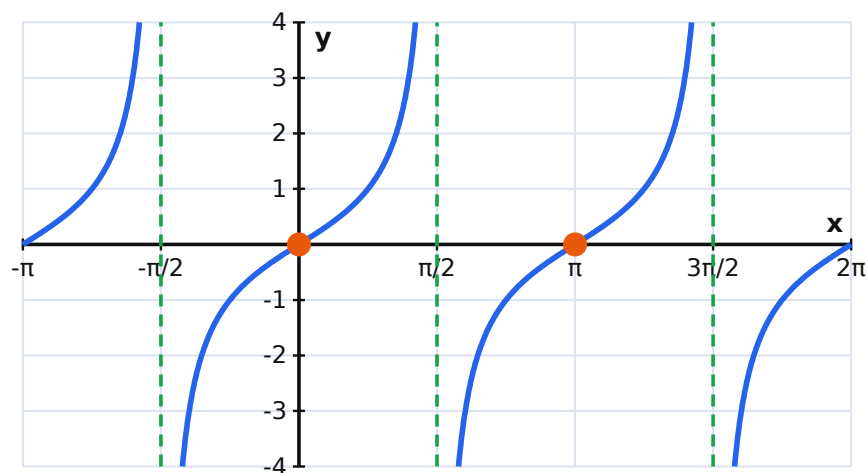
Question 5

What is the period of $y = \tan \frac{x}{2}$?

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

Question 6

Which x -value in $[0, \pi]$ is a vertical asymptote of $y = \tan x$? (see the graph)



Tangent graph.

- A. $x = \frac{\pi}{4}$
- B. $x = \pi$
- C. $x = 0$
- D. $x = \frac{\pi}{2}$

Question 7

The phase shift of $y = \sin\left(x + \frac{\pi}{4}\right)$ is...

- A. $\frac{\pi}{4}$ right
- B. $\frac{\pi}{2}$ left
- C. $\frac{\pi}{4}$ left
- D. $\frac{\pi}{4}$ up

Question 8

A tide ranges from 3 ft to 7 ft with period 12 h. The tide graph below starts at high tide. Which model fits?



Depth model.

- A. $d = 5 + 2\cos\frac{\pi t}{6}$
- B. $d = 5 + 2\sin\frac{\pi t}{6}$
- C. $d = 2 + 5\cos\frac{\pi t}{6}$
- D. $d = 5 + 2\cos 12t$

Question 9

What is the range of $y = 3\cos x - 1$?

- A. $[-3, 3]$
- B. $[-1, 3]$
- C. $[-4, 2]$
- D. $[-2, 4]$

Question 10

A wave has max 9 and min 1. What is its amplitude?

- A. 5
- B. 8
- C. 10
- D. 4

Answers

1. **A** - Amplitude is the absolute value of a , so 7. The negative only reflects the graph.
2. **B** - Period = $2\pi / 4 = \pi/2$.
3. **A** - The vertical shift $k = 5$ gives the midline $y = 5$.
4. **B** - Amplitude 3 and period π mean $b = 2$. It starts at 0 and rises, so it is sine.
5. **B** - For tangent the period is π divided by $|b|$, and $b = 1/2$ gives 2π .
6. **D** - Tangent is undefined where cosine is 0, which is $\pi/2$ in this interval. At 0 and π the graph passes through zero.
7. **C** - A plus inside shifts left: $x + \pi/4 = x - (-\pi/4)$.
8. **A** - Midline 5, amplitude 2, $b = 2\pi/12 = \pi/6$, and it starts at a maximum, so cosine.
9. **C** - Cosine ranges over $[-1, 1]$, so $3 \cos x$ covers $[-3, 3]$; subtract 1.
10. **D** - Amplitude = $(9 - 1)/2 = 4$. The midline is 5.

Remember

- Amplitude = $|a| = (\max - \min)/2$; midline $y = k = (\max + \min)/2$.
- Period of sine and cosine = $2\pi / |b|$; period of tangent = $\pi / |b|$.
- Phase shift h moves the graph right when h is positive.
- Tangent has vertical asymptotes at $x = \pi/2 + k\pi$.
- Use cosine for a model that starts at a maximum and sine for one that starts at the midline.