

Precalculus · Graphs of Trigonometric Functions · Quiz

Common Core F-TF.B.5, F-IF.C.7e, F-BF.B.3 · mathovore.fr

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

This precalculus trig graphs quiz asks 10 multiple-choice questions on graphs of trigonometric functions, and each answer comes with a short explanation.

Ten multiple-choice questions on amplitude, period, phase shift, range, tangent graphs, and models. Pick the one correct answer for each. Three questions include a graph.

Precalculus Common Core: F-TF.B.5 · F-IF.C.7e · F-BF.B.3

Questions

Question 1

What is the amplitude of $y = -5\sin 3x + 1$?

- A. -5
- B. 3
- C. 5
- D. 1

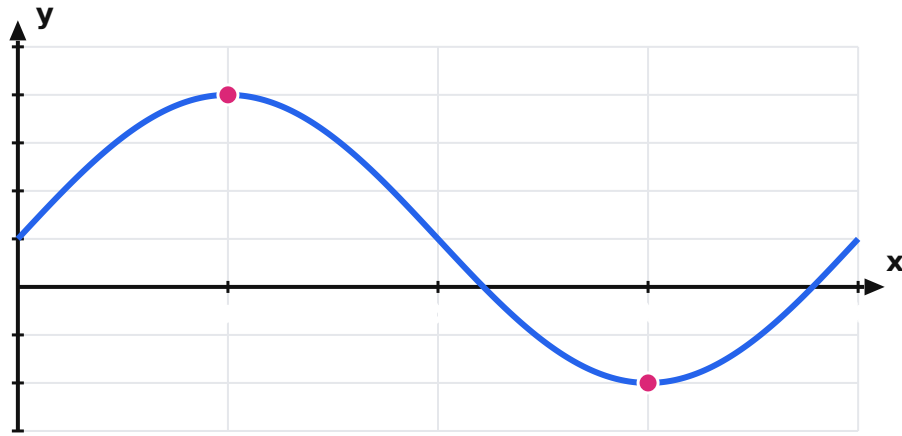
Question 2

What is the period of $y = \cos\left(\frac{x}{4}\right)$?

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

Question 3

The graph is of a sine function. Which equation matches it?



Sine wave with a maximum $(\pi, 4)$ and a minimum $(3\pi, -2)$.

- A. $y = 3\sin 2x + 1$
- B. $y = 3\sin\left(\frac{x}{2}\right) + 1$
- C. $y = 4\sin\left(\frac{x}{2}\right) + 1$
- D. $y = 3\sin\left(\frac{x}{2}\right) - 1$

Question 4

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

- A. $-5 \leq y \leq -1$
- B. $-2 \leq y \leq 2$
- C. $-6 \leq y \leq 0$
- D. $-5 \leq y \leq 1$

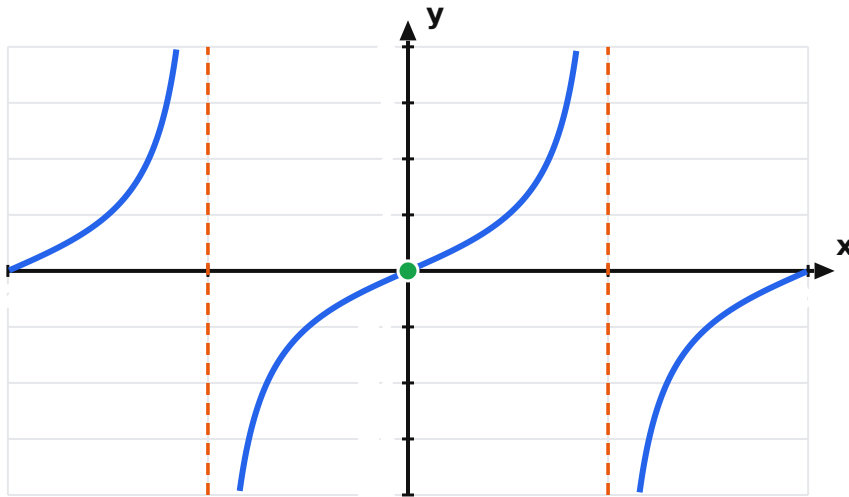
Question 5

What is the phase shift of $y = \cos(2x + \pi)$?

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

Question 6

What is the period of the function graphed?

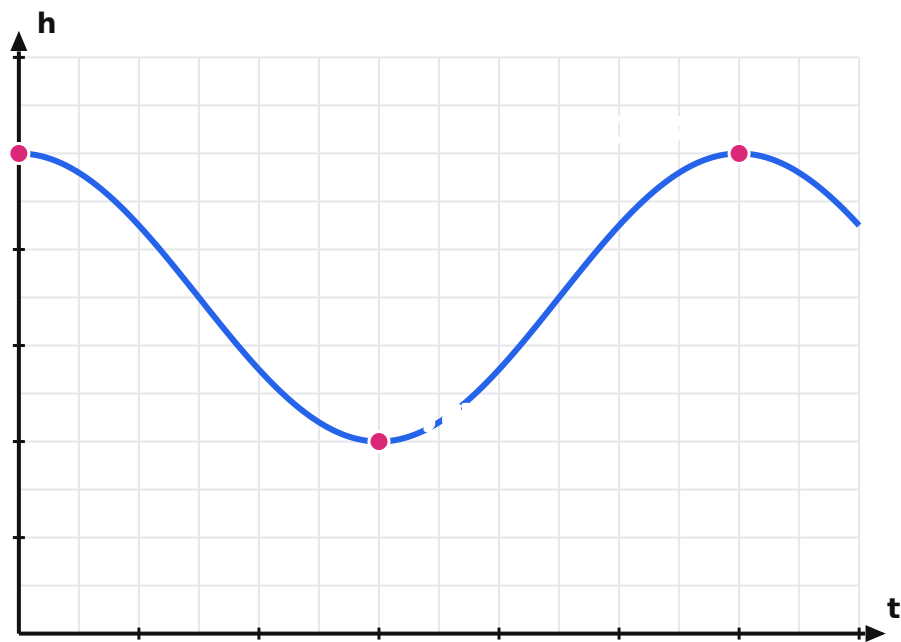


Tangent-shaped curve with asymptotes at $x = -\pi$ and $x = \pi$.

- A. 2π
- B. π
- C. $\frac{\pi}{2}$
- D. $\frac{1}{4}\pi$

Question 7

The graph shows a wave. Which function models it?



Wave with high points $(0, 10)$, $(12, 10)$ and low point $(6, 4)$.

A. $h = 3\cos\left(\frac{\pi t}{3}\right) + 7$

- B. $h = 3\cos\left(\frac{\pi t}{6}\right) + 7$
- C. $h = 7\cos\left(\frac{\pi t}{6}\right) + 3$
- D. $h = 3\sin\left(\frac{\pi t}{6}\right) + 7$

Question 8

What is the value of $y = 4\tan x$ at $x = \frac{\pi}{4}$?

- A. 4
- B. 1
- C. π
- D. $\sqrt{2}$

Question 9

Which describes the graph of $y = \cos\left(x - \frac{\pi}{3}\right) + 2$ compared with $y = \cos x$?

- A. left $\frac{\pi}{3}$, up 2
- B. right $\frac{\pi}{3}$, down 2
- C. right $\frac{\pi}{3}$, up 2
- D. right 2, up $\frac{\pi}{3}$

Question 10

A periodic function has a maximum of 60 and a minimum of 20. What are its amplitude and midline?

- A. amplitude 40, midline $y = 20$
- B. amplitude 20, midline $y = 20$
- C. amplitude 40, midline $y = 40$
- D. amplitude 20, midline $y = 40$

Answer key

1. **C** - Amplitude is $|A|=5$. The negative sign reflects the graph and does not make the amplitude negative.
2. **D** - Period $= \frac{2\pi}{1/4} = 8\pi$. Using $\frac{1}{B}$ only gives 4π , which forgets the 2π .
3. **B** - Amplitude $\frac{4-(-2)}{2}=3$, midline $y=1$, period 4π so $B=\frac{1}{2}$. Using the maximum 4 as the amplitude is a common mistake.
4. **A** - The midline is $y=-3$ and the amplitude is 2, so y goes from $-3-2=-5$ to $-3+2=-1$.
5. **B** - $\cos(2x+\pi)=\cos\left(2\left(x+\frac{\pi}{2}\right)\right)$. Factoring out 2 shows a shift of $\frac{\pi}{2}$ to the left.
6. **A** - Neighboring asymptotes are at $-\pi$ and π , a distance of 2π apart. That is the period (the function is $y=\tan\frac{x}{2}$).
7. **B** - $A=3$, $D=7$, period 12 so $B=\frac{\pi}{6}$. The curve starts at a maximum, so it is a cosine with no shift.
8. **A** - $\tan\frac{\pi}{4}=1$, so $y=4\cdot 1=4$.
9. **C** - Subtracting inside shifts right by $\frac{\pi}{3}$; adding outside shifts up by 2.
10. **D** - Amplitude $=\frac{60-20}{2}=20$ and midline $y=\frac{60+20}{2}=40$.

How does this quiz work?

Read each question, choose one answer among A, B, C and D, then check it: a short explanation appears after every answer. Your score out of 10 is shown at the end, and you can restart the quiz as often as you like.

What should you review before the quiz?

Reread the key facts of the lesson and the worked example. If a question is hard, go back to the matching part of the lesson, then try the quiz again. Write your work on scrap paper: most mistakes come from skipping a step, not from the idea itself.

Remember:

- Amplitude is half the distance between the maximum and the minimum.
- The period of sine and cosine is 2π divided by $|B|$; the period of tangent is π divided by $|B|$.
- A positive C shifts the graph right; a positive D shifts it up.
- Tangent has vertical asymptotes at $x = \pi/2 + k\pi$ and no amplitude.
- A periodic data set with a known maximum and minimum fits a model with $A = (M - m)/2$ and $D = (M + m)/2$.

How to use this precalculus trig graphs quiz

Retake this precalculus trig graphs quiz until every answer is right, then move on to the worksheet and the test.

