

Precalculus - Inverse Trigonometric Functions and Equations - Quiz

Common Core F-TF.B.6, F-TF.B.7 · maths-pdf.fr/en/

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

Pick the best answer for 10 questions on inverse trig functions and trig equations.
Explanations show common errors such as forgetting the second solution.

Precalculus · Common Core State Standards: **F-TF.B.6, F-TF.B.7**

Questions

Question 1

What is $\arcsin 1$?

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

Question 2

What is the range of $\arccos x$?

- A. $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
- B. $[0, \pi]$
- C. $[-1, 1]$
- D. $[0, 2\pi]$

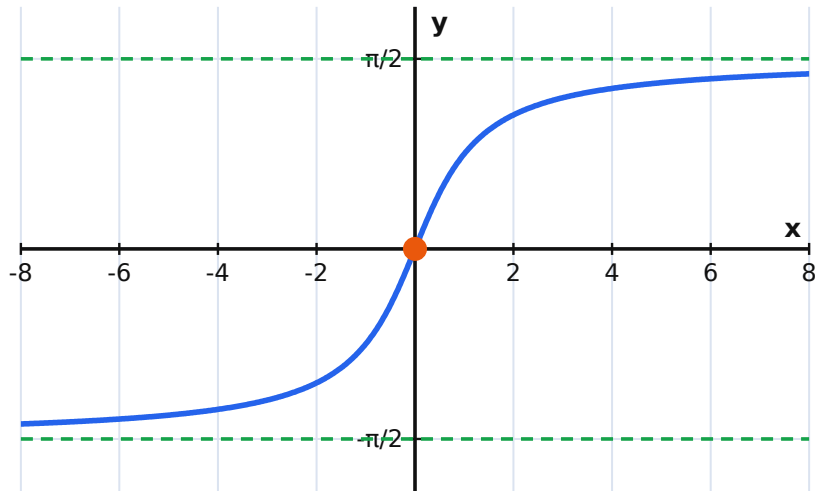
Question 3

Evaluate $\arctan(\sqrt{3})$.

- A. $\frac{\pi}{6}$
- B. $\frac{\pi}{4}$
- C. $\frac{\pi}{3}$
- D. $\frac{2\pi}{3}$

Question 4

The graph shows $y = \arctan x$. What are its horizontal asymptotes?



Graph of arctan.

- A. $y = \pm\pi$
- B. $y = \pm 1$
- C. $y = 0$
- D. $y = \pm\frac{\pi}{2}$

Question 5

Evaluate $\arcsin\left(\sin\frac{5\pi}{6}\right)$.

- A. $\frac{5\pi}{6}$
- B. $\frac{\pi}{6}$
- C. $-\frac{\pi}{6}$
- D. $\frac{\pi}{3}$

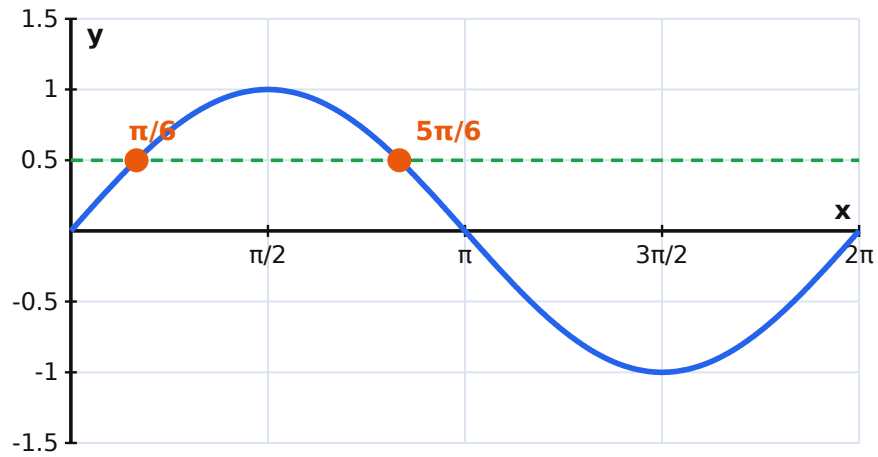
Question 6

What is $\cos\left(\arcsin\frac{3}{5}\right)$?

- A. $\frac{4}{5}$
- B. $\frac{3}{5}$
- C. $\frac{4}{4}$
- D. $\frac{4}{4}$

Question 7

How many solutions does $\sin x = \frac{1}{2}$ have on $[0, 2\pi)$?



Sine curve and $y = 1/2$.

- A. 1
- B. 2
- C. 3
- D. 4

Question 8

Solve $\cos x = -\frac{1}{2}$ on $[0, 2\pi)$.

- A. $\frac{2\pi}{3}, \frac{4\pi}{3}$
- B. $\frac{\pi}{3}, \frac{5\pi}{3}$
- C. $\frac{\pi}{3}, \frac{2\pi}{3}$
- D. $\frac{4\pi}{3}, \frac{5\pi}{3}$

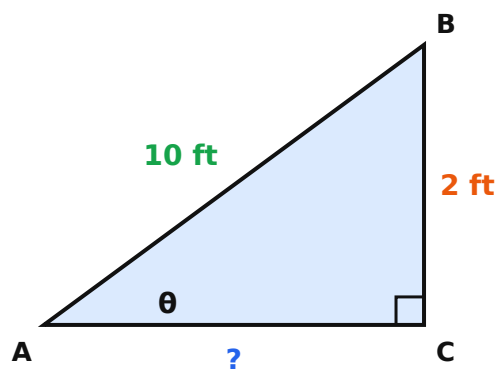
Question 9

All solutions of $\tan x = 1$ are...

- A. $\frac{\pi}{4} + 2\pi k$
- B. $\frac{\pi}{4} + \frac{\pi k}{2}$
- C. $\pm \frac{\pi}{4}$
- D. $\frac{\pi}{4} + \pi k$

Question 10

A ramp 10 ft long rises 2 ft. Which gives its angle?



A ramp triangle.

- A. $\arcsin \frac{2}{10}$
- B. $\arccos \frac{2}{10}$
- C. $\arctan \frac{10}{2}$
- D. $\sin \frac{2}{10}$

Answers

1. **C** - $\sin(\pi/2) = 1$, and $\pi/2$ is in the range of $\arcsin$.
2. **B** - $\arccos$ returns angles from 0 to π .
3. **C** - $\tan(\pi/3) = \sqrt{3}$.
4. **D** - $\arctan$ approaches $\pi/2$ and $-\pi/2$ as x goes to plus or minus infinity.
5. **B** - $\sin(5\pi/6) = 1/2$, and $\arcsin(1/2) = \pi/6$ because it must be in the range.
6. **A** - A 3-4-5 triangle: the adjacent side is 4 and the hypotenuse 5.
7. **B** - The line meets the curve at $\pi/6$ and $5\pi/6$.
8. **A** - Cosine is negative in quadrants II and III with reference angle $\pi/3$.
9. **D** - Tangent has period π , so add πk .
10. **A** - The rise is opposite the angle and the ramp is the hypotenuse, so $\sin = 2/10$.

Remember

- $\arcsin$ and $\arctan$ have range (or closed range) centered on 0; $\arccos$ has range $[0, \pi]$.
- $\sin(\arcsin x) = x$ on $[-1, 1]$, but $\arcsin(\sin x) = x$ only for x in $[-\pi/2, \pi/2]$.
- $\sin^{-1} x$ means the inverse function, not $1/\sin x$.
- Sine and cosine equations usually have two solutions per period; tangent has one.
- Factor quadratic-type trig equations before solving.