

Tangent and Cotangent Quiz Answer Key PDF

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Select the true statements about the Pythagorean identities involving tangent and cotangent.

- A. $1 + \tan^2(\theta) = \sec^2(\theta)$ ✓
- B. $1 + \cot^2(\theta) = \csc^2(\theta)$ ✓
- C. $\tan^2(\theta) + 1 = \csc^2(\theta)$
- D. $\cot^2(\theta) + 1 = \sec^2(\theta)$

What is the value of $\tan(0)$?

- A. 0 ✓
- B. 1
- C. Undefined
- D. ∞

How would you use the unit circle to find the value of $\tan(\pi/3)$?

On the unit circle, $\tan(\pi/3)$ is the ratio of the y-coordinate to the x-coordinate at the angle $\pi/3$, which is $\sqrt{3}/2$ divided by $1/2$, resulting in $\sqrt{3}$.

Discuss the significance of the tangent function in real-world applications, providing at least one example.

The tangent function is significant in calculating slopes and angles in fields like engineering and physics. For example, it is used to determine the angle of elevation in surveying.

How does the periodicity of the tangent function affect its graph and solutions to equations involving tangent?

The periodicity of the tangent function, which is π , means that its graph repeats every π units. This affects solutions to equations involving tangent, as solutions will recur every π radians.

Which of the following are true for the equation $\tan(\theta) = a$?

- A. It has infinite solutions. ✓
- B. Solutions repeat every π radians. ✓
- C. It is undefined for $a = 0$.
- D. Solutions can be found using the unit circle. ✓

Describe the behavior of the cotangent function as it approaches its vertical asymptotes.

As the cotangent function approaches its vertical asymptotes, the function values increase or decrease without bound, moving towards positive or negative infinity.

What is the value of $\cot(\pi/4)$?

- A. 0
- B. 1 ✓
- C. $\sqrt{2}$
- D. Undefined

Which of the following angles will make cotangent undefined?

- A. $\pi/3$
- B. $\pi/2$
- C. π ✓
- D. $3\pi/2$

Select the correct identities involving cotangent.

- A. $\cot(\theta) = \cos(\theta)/\sin(\theta)$ ✓
- B. $\cot(\theta) = 1/\tan(\theta)$ ✓
- C. $\cot(\theta) = \sin(\theta)/\cos(\theta)$
- D. $\cot(\theta) = 1/\sin(\theta)$

At which angle is the tangent function undefined?

- A. 0
- B. $\pi/4$
- C. $\pi/2$ ✓**
- D. π

What is the symmetry of the cotangent function?

- A. Even
- B. Odd ✓**
- C. Neither
- D. Both

What is the period of the tangent function?

- A. $\pi/2$
- B. π ✓**
- C. 2π
- D. 4π

Which identity is correct for tangent?

- A. $\tan(\theta) = \cos(\theta)/\sin(\theta)$
- B. $\tan(\theta) = \sin(\theta)/\cos(\theta)$ ✓**
- C. $\tan(\theta) = 1/\sin(\theta)$
- D. $\tan(\theta) = 1/\cos(\theta)$

Explain the relationship between the tangent and cotangent functions in terms of their graphs and asymptotes.

The tangent function, defined as $\tan(x) = \sin(x)/\cos(x)$, has vertical asymptotes at $x = (2n+1)\pi/2$ for $n \in \mathbb{Z}$, where $\cos(x) = 0$. The cotangent function, defined as $\cot(x) = \cos(x)/\sin(x)$, has vertical asymptotes at $x = n\pi$ for $n \in \mathbb{Z}$, where $\sin(x) = 0$. The graphs of these functions are periodic with a period of π , and they are reflections of each other across the line $y = x$.

Which of the following is the reciprocal of the tangent function?

- A. Sine
- B. Cosine
- C. Secant
- D. Cotangent ✓**

Explain why the tangent function is considered an odd function.

The tangent function is an odd function because it follows the rule $\tan(-x) = -\tan(x)$, which means that the function's values at negative angles are the negatives of the values at their corresponding positive angles.

Which of the following are true about the tangent function?

- A. It is periodic with period 2π .
- B. It is an odd function. ✓**
- C. It has vertical asymptotes at $\theta = \pi/2 + k\pi$. ✓**
- D. It is undefined at $\theta = k\pi$.

Which of the following statements are true about the tangent graph?

- A. It passes through the origin. ✓**
- B. It has a horizontal asymptote at $y = 0$.
- C. It is symmetric about the origin. ✓**
- D. It repeats every π radians. ✓**

Which of the following are characteristics of the cotangent function?

- A. Period is π . ✓**
- B. It is an even function.
- C. It has vertical asymptotes at $\theta = k\pi$. ✓**
- D. It is undefined at $\theta = \pi/2 + k\pi$.