

Evaluate Different Trig Expressions Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

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

Hint: Think about the relationship between sine and its reciprocal functions.

- A) Cosine
- A) Secant
- A) Cosecant ✓
- A) Tangent

■ The reciprocal of the sine function is cosecant.

Select all the correct Pythagorean identities.

Hint: Recall the fundamental identities involving sine, cosine, and tangent.

- A) $\sin^2(\theta) + \cos^2(\theta) = 1$ ✓
- A) $1 + \tan^2(\theta) = \sec^2(\theta)$ ✓
- A) $\sin(\theta)\cos(\theta) = 1$
- A) $1 + \cot^2(\theta) = \csc^2(\theta)$ ✓

■ The correct Pythagorean identities are $\sin^2(\theta) + \cos^2(\theta) = 1$, $1 + \tan^2(\theta) = \sec^2(\theta)$, and $1 + \cot^2(\theta) = \csc^2(\theta)$.

Define the tangent function in terms of sine and cosine.

Hint: Consider the ratio of sine to cosine.

The tangent function is defined as $\tan(\theta) = \sin(\theta)/\cos(\theta)$.

List the trigonometric values for $\sin(30^\circ)$, $\cos(45^\circ)$, and $\tan(60^\circ)$.

Hint: Recall the special angle values.

1. $\sin(30^\circ)$

$1/2$

2. $\cos(45^\circ)$

$\sqrt{2}/2$

3. $\tan(60^\circ)$

$\sqrt{3}$

The values are $\sin(30^\circ) = 1/2$, $\cos(45^\circ) = \sqrt{2}/2$, and $\tan(60^\circ) = \sqrt{3}$.

Part 2: comprehension and Application

Which identity can be used to simplify $\sin(\alpha + \beta)$?

Hint: Think about the angle addition formulas.

- A) $\sin(\alpha)\cos(\beta) + \cos(\alpha)\sin(\beta)$ ✓
- A) $\cos(\alpha)\cos(\beta) - \sin(\alpha)\sin(\beta)$
- A) $\tan(\alpha) + \tan(\beta)$
- A) $\sin^2(\alpha) + \cos^2(\beta)$

■ The identity used to simplify $\sin(\alpha + \beta)$ is $\sin(\alpha)\cos(\beta) + \cos(\alpha)\sin(\beta)$.

Which of the following are correct values for special angles?

Hint: Recall the values of sine, cosine, and tangent for common angles.

- A) $\sin(45^\circ) = \sqrt{2}/2$ ✓
- A) $\cos(60^\circ) = 1/2$ ✓
- A) $\tan(90^\circ) = 1$
- A) $\sin(90^\circ) = 1$ ✓

■ The correct values for special angles are $\sin(45^\circ) = \sqrt{2}/2$, $\cos(60^\circ) = 1/2$, and $\sin(90^\circ) = 1$.

Explain the significance of the unit circle in trigonometry.

Hint: Consider how the unit circle relates to trigonometric functions.

■ The unit circle provides a geometric representation of trigonometric functions, allowing for the visualization of angles and their corresponding sine and cosine values.

Solve the equation $2\sin(x) - 1 = 0$ for x in the interval $[0^\circ, 360^\circ]$.

Hint: Isolate $\sin(x)$ and find the corresponding angles.

■ The solutions are $x = 30^\circ$ and $x = 150^\circ$.

Part 3: Analysis, Evaluation, and Creation

Which graph represents a function with a period of π ?

Hint: Consider the periodic nature of trigonometric functions.

- A) $y = \sin(x)$
- A) $y = \cos(x)$
- A) $y = \tan(x)$ ✓
- A) $y = \sec(x)$

■ The graph that represents a function with a period of π is $y = \tan(x)$.

Analyze the following expressions and select those that are equivalent to $\tan(\theta)$.

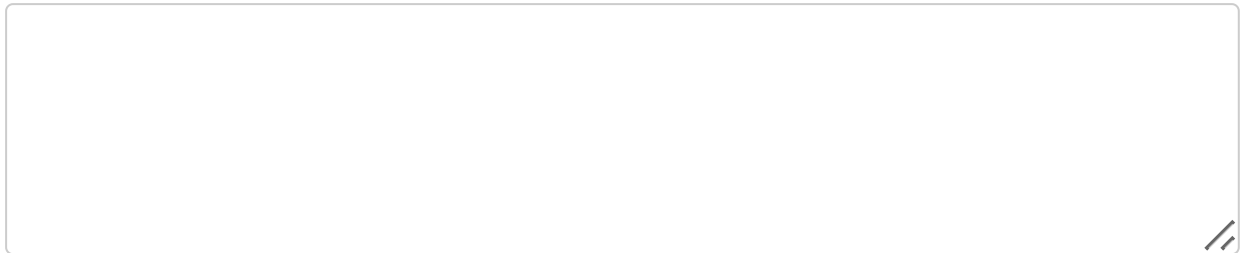
Hint: Recall the definition of tangent in terms of sine and cosine.

- A) $\sin(\theta)/\cos(\theta)$ ✓
- A) $1/\cot(\theta)$ ✓
- A) $\cos(\theta)/\sin(\theta)$
- A) $\sec(\theta)\csc(\theta)$

■ The expressions equivalent to $\tan(\theta)$ are $\sin(\theta)/\cos(\theta)$ and $1/\cot(\theta)$.

Compare and contrast the graphs of $y = \sin(x)$ and $y = \cos(x)$, focusing on amplitude and phase shift.

Hint: Consider the key characteristics of both functions.



Both graphs have the same amplitude of 1, but the sine graph has a phase shift of $\pi/2$ compared to the cosine graph.

Which of the following scenarios best describes an application of trigonometry in real life?

Hint: Think about practical uses of trigonometric concepts.

- A) Calculating the area of a rectangle
- A) Determining the height of a building using its shadow ✓
- A) Measuring the volume of a cylinder
- A) Counting the number of sides in a polygon

Determining the height of a building using its shadow is a common application of trigonometry.

Evaluate the following statements and select those that correctly describe the properties of inverse trigonometric functions.

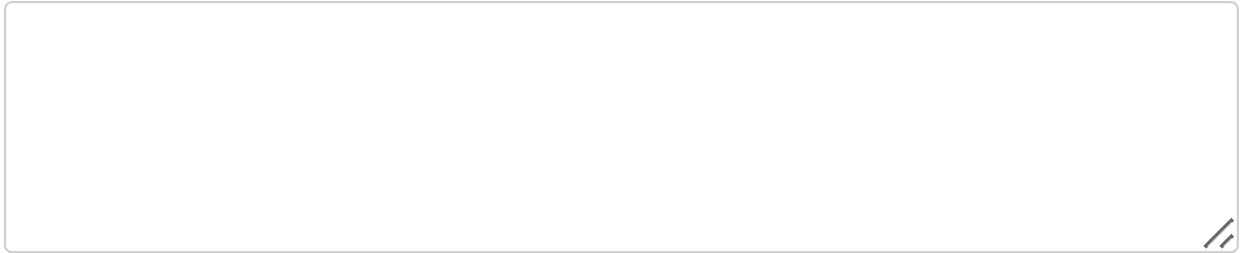
Hint: Consider the definitions and ranges of inverse functions.

- A) $\arcsin(x)$ is defined for all real numbers.
- A) $\arccos(x)$ has a range of $[0, \pi]$. ✓
- A) $\arctan(x)$ is defined for all real numbers. ✓
- A) $\arcsin(x)$ has a range of $[-\pi/2, \pi/2]$. ✓

The correct statements are $\arccos(x)$ has a range of $[0, \pi]$, $\arctan(x)$ is defined for all real numbers, and $\arcsin(x)$ has a range of $[-\pi/2, \pi/2]$.

Design a real-world problem that involves using trigonometric identities to find an unknown angle or side in a triangle. Describe the problem and outline the steps to solve it.

Hint: Think about a scenario involving triangles and trigonometric relationships.



An example problem could involve finding the height of a tree using the angle of elevation and distance from the tree.