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(θ) = sin(θ)/cos(θ).**

List the trigonometric values for sin(30°), cos(45°), and tan(60°).

Hint: Recall the special angle values.

1. sin(30°)

> 1/2

2. cos(45°)

> √2/2

3. tan(60°)

> √3

> The values are sin(30°) = 1/2, cos(45°) = √2/2, and tan(60°) = √3.

Part 2: comprehension and Application

Which identity can be used to simplify sin(α + β)?

Hint: Think about the angle addition formulas.

- ◯ **A) sin(α)cos(β) + cos(α)sin(β) ✓**
- ◯ A) cos(α)cos(β) - sin(α)sin(β)
- ◯ A) tan(α) + tan(β)
- ◯ A) $\sin^2(\alpha) + \cos^2(\beta)$

> The identity used to simplify sin(α + β) is sin(α)cos(β) + cos(α)sin(β).

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°) = √2/2 ✓**
- ☐ **A) cos(60°) = 1/2 ✓**
- ☐ A) tan(90°) = 1
- ☐ **A) sin(90°) = 1 ✓**

> The correct values for special angles are sin(45°) = √2/2, cos(60°) = 1/2, and sin(90°) = 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 2sin(x) - 1 = 0 for x in the interval [0°, 360°].

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

The solutions are x = 30° and x = 150°.

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(θ).

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

- ☐ **A) sin(θ)/cos(θ) ✓**
- ☐ **A) 1/cot(θ) ✓**
- ☐ A) cos(θ)/sin(θ)
- ☐ A) sec(θ)csc(θ)

The expressions equivalent to tan(θ) are sin(θ)/cos(θ) and 1/cot(θ).

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 π/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, π]. ✓**
- ☐ **A) arctan(x) is defined for all real numbers. ✓**
- ☐ **A) arcsin(x) has a range of [-π/2, π/2]. ✓**

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