Unit Circle Worksheet Answer Key PDF

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Part 1: Foundational Knowledge

What is the radius of the unit circle?

undefined. A) 0

undefined. A) 0.5

undefined. C) 1 ✓

undefined. D) 2

The radius of the unit circle is always 1.

Which of the following angles are commonly used in the unit circle? (Select all that apply)

undefined. A) 30° ✓

undefined. A) 45° ✓

undefined. C) 75°

undefined. D) 90° ✓

Common angles include 30°, 45°, and 90°.

Define the unit circle and explain its significance in trigonometry.

The unit circle is a circle with a radius of 1 centered at the origin, used to define trigonometric functions.

List the sine and cosine values for the angle 0° on the unit circle.

1. Sine value for 0°

0

2. Cosine value for 0°

1

The sine of 0° is 0 and the cosine of 0° is 1.

Part 2: Understanding Concepts

What is the sine of 90° on the unit circle?

undefined. A) 0
undefined. A) 0.5
undefined. C) 1 ✓
undefined. D) -1

The sine of 90° is 1.

Which of the following statements about the unit circle are true? (Select all that apply)

undefined. A) The x-coordinate represents the sine of the angle.
undefined. A) The y-coordinate represents the cosine of the angle.
undefined. C) The radius is always 1. ✓
undefined. D) The circle is centered at the origin. ✓

The true statements include that the radius is always 1 and the circle is centered at the origin.

Explain how the unit circle helps in converting degrees to radians.

The unit circle provides a visual representation to convert degrees to radians using the formula π radians = 180°.

Part 3: Applying Knowledge

If the cosine of an angle is 0.5, what is the angle in degrees?

undefined. A) 30°
undefined. A) 45°
undefined. C) 60° ✓

undefined. D) 90°

The angle is 60°.

Which angles in the unit circle have a tangent value of 1? (Select all that apply)

undefined. A) 45° ✓
undefined. A) 135°
undefined. C) 225° ✓
undefined. D) 315°

The angles are 45° and 225°.

Calculate the sine and cosine values for 60° and explain the process.

The sine of 60° is √3/2 and the cosine is 1/2, derived from the coordinates on the unit circle.

Part 4: Analyzing Relationships

In which quadrant is the angle 150° located, and what are the signs of its sine and cosine?

undefined. A) Quadrant I, both positive
undefined. A) Quadrant II, sine positive, cosine negative ✓
undefined. C) Quadrant III, both negative
undefined. D) Quadrant IV, sine negative, cosine positive

The angle is in Quadrant II, where sine is positive and cosine is negative.

Analyze the symmetry of the unit circle and identify which of the following angles have the same sine value. (Select all that apply)

undefined. A) 30° ✓
undefined. A) 150° ✓
undefined. C) 210°
undefined. D) 330°

The angles with the same sine value are 30° and 150°.

Discuss how the unit circle can be used to determine the trigonometric values of angles greater than 360°.

The unit circle can be used to find values for angles greater than 360° by subtractively reducing the angle to an equivalent angle within the first rotation.

Part 5: Synthesis and Reflection

Evaluate the following statement: "The unit circle can only be used for angles between 0° and 360°." Is this statement true or false?

undefined. A) True

undefined. A) False ✓

undefined. C) Not applicable

undefined. D) Only for positive angles

The statement is false; the unit circle can be used for any angle.

Consider a real-world scenario where the unit circle is used to model periodic phenomena. Which of the following could be modeled using the unit circle? (Select all that apply)

undefined. A) The motion of a Ferris wheel ✓

undefined. A) The phases of the moon ✓

undefined. C) The growth of a plant

undefined. D) The sound waves of a musical note ✓

The unit circle can model the motion of a Ferris wheel and the phases of the moon.

Create a real-world problem that involves using the unit circle to solve a trigonometric equation, and provide a step-by-step solution.

Students should create a problem involving a real-world scenario and demonstrate the use of the unit circle in solving it.