

Geometry & Trigonometry: SOH CAH TOA & Right Triangles



Name: _____ Date: _____

Part A: Trigonometric Calculations. Apply SOH CAH TOA to determine exact ratios and side lengths.

1. In right triangle ABC with right angle at C, leg AC (adjacent to angle A) = 15 cm and hypotenuse AB = 17 cm. What is the value of $\cos(A)$?

- A. $8 / 17$
- B. $15 / 17$
- C. $15 / 8$
- D. $8 / 15$

2. A surveyor stands 100 meters away from the base of a telecommunications tower on level ground. The angle of elevation from the ground to the top of the tower is 30° . Given that $\tan(30^\circ) \approx 0.577$, what is the approximate height of the tower?

- A. 57.7 meters
- B. 86.6 meters
- C. 173.2 meters
- D. 50.0 meters

3. In any right triangle where angle A and angle B are complementary acute angles ($A + B = 90^\circ$), which trigonometric co-function identity is always true?

- A. $\sin(A) = \tan(B)$
- B. $\sin(A) = \cos(B)$
- C. $\cos(A) = \cos(B)$
- D. $\tan(A) = \sin(B)$

Part B: Special Right Triangle Exact Values. Fill in the exact simplified fraction or integer for each trigonometric ratio.

Word bank: 0.5, 1, 0, 0.707, 2

1. In a 30° - 60° - 90° special right triangle, the exact ratio of the shortest side to the hypotenuse yields $\sin(30^\circ) = \underline{\hspace{2cm}}$ (or $1/2$).

2. In a 45° - 45° - 90° isosceles right triangle, both legs are of equal length, which means $\tan(45^\circ) = \text{Opposite} / \text{Adjacent} = \underline{\hspace{2cm}}$ exactly.

3. According to the fundamental Pythagorean trigonometric identity, for any angle θ , $\sin^2(\theta) + \cos^2(\theta) = \underline{\hspace{2cm}}$.

4. In a right triangle where $\sin(\theta) = \cos(\theta)$, the acute angle θ must be 45° , so $\tan(\theta) = \underline{\hspace{2cm}}$.