

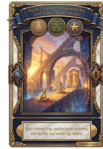
Right Triangle Trigonometry and Early Applications

Right-triangle trig, applied angle problems, and the first real-world trig models.

Name _____ Date _____

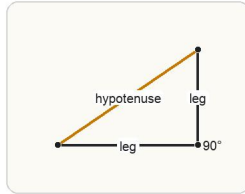
32 main 2-up grid 3 pages

Completion Reward



Shown here as a small pack artifact, not a preview destination.

1. In a right triangle, what is the hypotenuse?



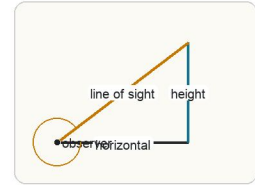
The hypotenuse is the side opposite the 90-degree angle, so it is determined by the right angle, not by horizontal or vertical position.

- A. The shorter leg
- B. The side next to the chosen angle only
- C. The side opposite the right angle
- D. The vertical leg

2. Relative to an acute angle, what does opposite mean?

- A. The hypotenuse only
- B. The side touching the angle and the right angle
- C. The shortest side
- D. The side across from that angle

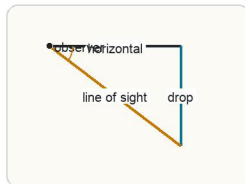
3. What is an angle of elevation?



Measure upward from a horizontal line of sight to the object being viewed.

- A. An angle measured downward from a horizontal line of sight
- B. An angle measured upward from a horizontal line of sight
- C. The right angle in a triangle
- D. Any angle greater than 90 degrees

4. What is an angle of depression?



Measure downward from a horizontal line of sight to the object below the viewer.

- A. An angle measured downward from a horizontal line of sight
- B. An angle measured upward from the ground
- C. The smallest angle in any triangle
- D. The angle opposite the hypotenuse

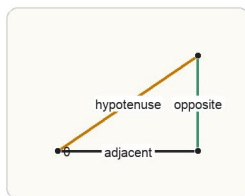
5. Why is a 3-4-5 triangle useful in trig practice?

- A. It always has 45-degree angles.
- B. It gives exact side ratios in a right triangle.
- C. It is the only right triangle.
- D. It makes tangent undefined.

6. If one acute angle in a right triangle is 37 degrees, what is the other acute angle?

- A. 53 degrees
- B. 37 degrees
- C. 43 degrees
- D. 90 degrees

7. Which ratio matches $\sin(\theta)$?



Label the sides relative to theta first, then build the ratio using the side across from theta and the hypotenuse.

- A. adjacent / hypotenuse
- B. opposite / adjacent
- C. opposite / hypotenuse
- D. adjacent / opposite

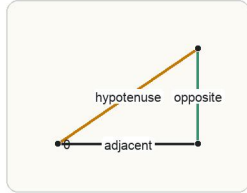
8. Which ratio matches $\cos(\theta)$?

- A. opposite / hypotenuse
- B. adjacent / hypotenuse
- C. opposite / adjacent
- D. hypotenuse / adjacent

9. Which ratio matches $\tan(\theta)$?

- A. adjacent / opposite
- B. opposite / adjacent
- C. opposite / hypotenuse
- D. hypotenuse / adjacent

10. If you know an angle of elevation, the opposite side, and the adjacent side, which ratio is usually most direct?



If the known sides are opposite and adjacent to the angle, tangent uses exactly those two lengths with no extra conversion.

- A. sine
- B. cosine
- C. tangent
- D. secant

13. Which situation uses an angle of depression?

- A. Looking up at a plane from the ground
- B. Measuring the interior angle of a triangle
- C. Finding the slope of a line
- D. Looking down from a lighthouse to a boat

16. In a 3-4-5 right triangle, if the side opposite theta is 3, find $\sin(\theta)$. Enter as a decimal. Answer with a number.

19. A right triangle has legs 6 and 8. What is the hypotenuse? Answer with a number.

22. A ladder makes a 45-degree angle with the ground and reaches 10 feet horizontally from the wall. How high does it reach? Answer to the nearest foot.

25. If opposite = 7 and hypotenuse = 25, write $\sin(\theta)$. Answer as an equation.

28. If one acute angle is theta in a right triangle, state the other acute angle. Answer as an expression.

11. If you know the opposite side and the hypotenuse, which trig ratio is most direct?

- A. sine
- B. cosine
- C. tangent
- D. cotangent

14. What is the best first step in a right-triangle application problem?

- A. Take a reciprocal immediately.
- B. Assume the angle is 45 degrees.
- C. Sketch and label the triangle with the known sides and angles.
- D. Ignore the words and use tangent.

17. In a 3-4-5 right triangle, if the side adjacent to theta is 4, find $\cos(\theta)$. Enter as a decimal. Answer with a number.

20. In a 3-4-5 right triangle, what acute angle has opposite side 3 and hypotenuse 5? Answer to the nearest degree.

23. A ramp rises 3 feet over a horizontal run of 12 feet. What is $\tan(\theta)$ for the angle of elevation? Enter as a decimal. Answer with a number.

26. If adjacent = 12 and hypotenuse = 13, write $\cos(\theta)$. Answer as an equation.

29. A ladder leans at 60 degrees and has length 12. Write an equation relating the height h to the given values. Answer as an equation.

12. Which situation uses an angle of elevation?

- A. Looking up at the top of a building from the ground
- B. Looking down from a cliff to the beach
- C. Measuring a right angle in a room
- D. Comparing two horizontal distances

15. A student chooses cosine when the known sides are opposite and adjacent. What is the mistake?

- A. Cosine uses opposite and adjacent, so there is no mistake.
- B. They should have used secant instead.
- C. Cosine uses adjacent and hypotenuse, so tangent is the direct ratio.
- D. They should have used no trig ratio at all.

18. In a 3-4-5 right triangle, if opposite = 3 and adjacent = 4, find $\tan(\theta)$. Enter as a decimal. Answer with a number.

21. In a 3-4-5 right triangle, what acute angle has opposite side 4 and hypotenuse 5? Answer to the nearest degree.

24. Which student correctly uses SOHCAHTOA for opposite = 6 and hypotenuse = 10?

- A. Student B: $\cos(\theta) = 6 / 10$.
- B. Student A: $\sin(\theta) = 6 / 10$.
- C. Student C: $\tan(\theta) = 10 / 6$.
- D. Student D: $\sec(\theta) = 6 / 10$.

27. If opposite = 5 and adjacent = 12, write $\tan(\theta)$. Answer as an equation.

30. A ramp makes a 30-degree angle with the ground and rises 4 feet. Write an equation relating the horizontal run x to the given values. Answer as an equation.

31. A cable is 15 feet long and makes a 53-degree angle with the ground. Write an equation relating the horizontal distance d to the given values. Answer as an equation.
32. From a point 20 feet from a tree, the angle of elevation to the top is 45 degrees. Write an equation relating the height h to the given values. Answer as an equation.