ALBERT

Name _____ Date _____

Trig Ratios Worksheet

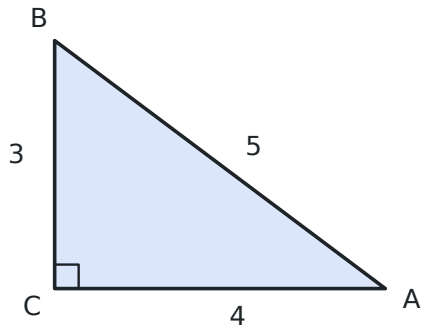
Geometry · Common Core HSG-SRT.C.6

> Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

Practice

Builds the skill step by step.

1. In right △ABC, C is the right angle, BC = 3, AC = 4 and AB = 5. What is sin A?



2. In the same triangle (BC = 3, AC = 4, AB = 5, right angle at C), what is cos A?

3. In the same triangle (BC = 3, AC = 4, AB = 5, right angle at C), what is tan A?

4. In a right triangle, which ratio is cos A?

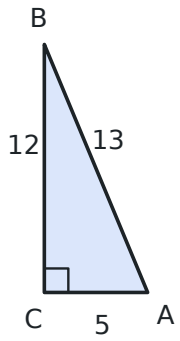
   A. opposite leg ÷ hypotenuse

   B. opposite leg ÷ adjacent leg

   C. hypotenuse ÷ adjacent leg

   D. adjacent leg ÷ hypotenuse

5. In right $\triangle ABC$ with right angle C, BC = 12, AC = 5 and AB = 13. What is sin A?



6. In the same triangle (BC = 12, AC = 5, AB = 13, right angle at C), what is tan B?

7. Why is sin 40° the same in every right triangle with a 40° angle?

   A. It isn't the same.

   B. All such triangles are similar, so the ratio of the sides is the same.

   C. Because the triangles are congruent.

   D. Because the hypotenuse is always 1.

8. $\sin 30° = \frac{1}{2}$. A right triangle has a 30° angle and a hypotenuse of 10. How long is the side opposite the 30° angle?

9. What is tan 45°?

10. In a right triangle, cos A = 0.6 and the hypotenuse is 15. How long is the side adjacent to A?

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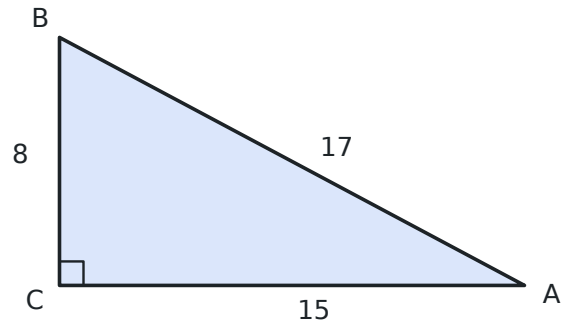
On Level

Grade-level practice.

1. In right △ABC with right angle C, BC = 8, AC = 15 and AB = 17. What is sin A?



2. In the same triangle (BC = 8, AC = 15, AB = 17, right angle at C), what is cos B?

3. A 30°-60°-90° triangle has a hypotenuse of 2, a short leg of 1 and a long leg of √3. What is sin 60°?

   A. $\frac{1}{2}$

   B. √3

   C. √3/2

   D. √2/2

4. A 45°-45°-90° triangle has legs of 1 and a hypotenuse of √2. What is sin 45°?

   A. $\frac{1}{2}$

   B. √2/2

   C. √2

   D. 1

5. In a right triangle, tan A = $\frac{3}{4}$ and the hypotenuse is 20. How long is the side opposite A?

6. In right △ABC with right angle C, why is sin A = cos B?

   A. The side opposite A is the side adjacent to B, and both use the same hypotenuse.

   B. Because A and B are equal.

   C. Because sine and cosine are always equal.

   D. Because C is 90°.

7. A right triangle has legs 7 and 24 and hypotenuse 25. What is the cosine of the angle opposite the leg of 7?

8. In a right triangle, sin A = $\frac{5}{13}$. What is cos A?

9. In a right triangle, tan A = 1. What is the measure of angle A?

10. Two right triangles each have an acute angle A. The small one has sides 3, 4, 5 with 3 opposite A. The large one has hypotenuse 15. How long is the side opposite A in the large triangle?

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Challenge

Multi-step and word problems that stretch it.

1. In a right triangle, $\sin A = 0.8$. What is $\tan A$?

2. In a right triangle, $\tan A = \frac{7}{24}$. What is $\cos A$?

3. In a 5-12-13 right triangle, what is $(\sin A)^2 + (\cos A)^2$ for either acute angle?

4. As acute angle A gets larger (from near 0° toward 90°), what happens to $\sin A$?

   A. It increases.

   B. It decreases.

   C. It stays the same.

   D. It goes up and then down.

5. In a right triangle, $\cos A = \frac{8}{17}$. What is $\sin A$?

6. A right triangle has $\sin A = \frac{3}{5}$ and a hypotenuse of 30. What is its perimeter?

7. In a right triangle, tan A = 2 and the side adjacent to A is 5. How long is the hypotenuse? Give the exact value.

8. A 30°-60°-90° triangle has a short leg of 4. How long is the hypotenuse?

9. Which value can NOT be the sine of an acute angle?

   A. 1.2

   B. 0.2

   C. 0.5

   D. 0.99

10. Explain why tan A = sin A ÷ cos A in a right triangle.