

Name: _____

Introduction to Trigonometry

The field of mathematics called "Trigonometry" is the study of right triangles.

Key word: SOH CAH TOA or $S \frac{O}{H}$ $C \frac{A}{H}$ $T \frac{O}{A}$

$$\sin x^\circ = \frac{\text{opposite(leg)}}{\text{hypotenuse}} \quad \cos x^\circ = \frac{\text{adjacent(leg)}}{\text{hypotenuse}} \quad \tan x^\circ = \frac{\text{opposite(leg)}}{\text{adjacent(leg)}}$$

S: sine (sin)

C: cosine (cos)

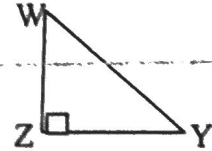
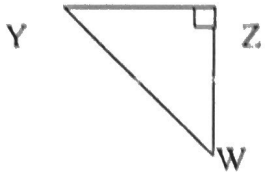
T: tangent (tan)

O: opposite leg

A: adjacent leg

H: hypotenuse

The three sides of the triangles are referred to as Hypotenuse (H), Adjacent (A), and Opposite (O). Label each side of each triangle using angle W as your reference.



Use the triangle at the right to determine the following values.

$\sin 40^\circ = \text{_____}$

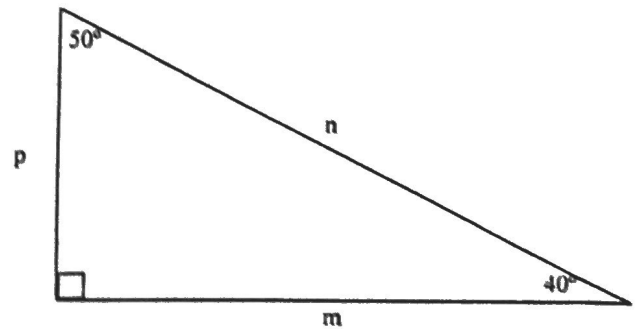
$\sin 50^\circ = \text{_____}$

$\cos 40^\circ = \text{_____}$

$\cos 50^\circ = \text{_____}$

$\tan 40^\circ = \text{_____}$

$\tan 50^\circ = \text{_____}$



Write each ratio in simplest form.

1. $\sin A$

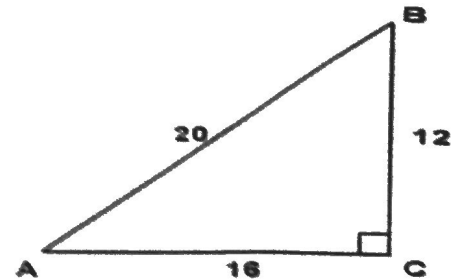
2. $\cos A$

3. $\tan A$

4. $\sin B$

5. $\cos B$

6. $\tan B$



In right triangle HLK, name the ratio represented for the given angle.

7. $\angle H, \frac{15}{17}$

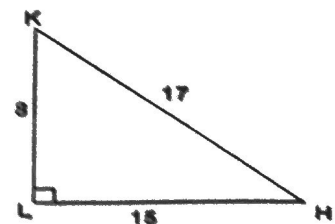
8. $\angle H, \frac{8}{17}$

9. $\angle H, \frac{8}{15}$

10. $\angle K, \frac{15}{8}$

11. $\angle K, \frac{15}{17}$

12. $\angle K, \frac{8}{17}$



Using special right triangles to write each trigonometric ratio as a fraction.

13. $\tan 60^\circ$

14. $\sin 45^\circ$

15. $\cos 30^\circ$

16. $\tan 45^\circ$

17. \cos

18. $\sin 60^\circ$

19. $\cos 45^\circ$

20. $\tan 30^\circ$

21. $\sin 30^\circ$

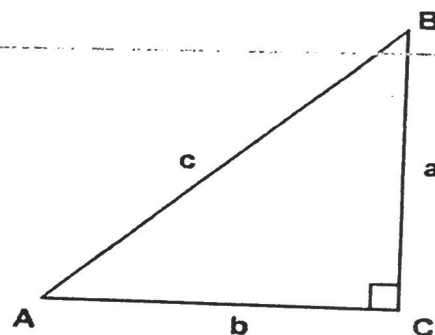
More Trigonometric Ratios

The cosine, sine and tangent ratios are defined in terms of the lengths of the sides of a right triangle. Three other ratios are the **secant**, the **cosecant** and the **cotangent** ratios. The ratios are abbreviated as sec, csc, cot.

$$\sec A = \frac{\text{length of hypotenuse}}{\text{length of side adjacent to } \angle A} = \frac{c}{b}$$

$$\csc A = \frac{\text{length of hypotenuse}}{\text{length of side opposite to } \angle A} = \frac{c}{a}$$

$$\cot A = \frac{\text{length of side adjacent to } \angle A}{\text{length of side opposite } \angle A} = \frac{b}{a}$$



The secant ratio for $\angle A$ is the reciprocal of its _____ ratio.
 The cosecant ratio for $\angle A$ is the reciprocal of its _____ ratio.
 The cotangent ratio for $\angle A$ is the reciprocal of its _____ ratio.

Write each ratio in simplest form.

22. $\sec A$

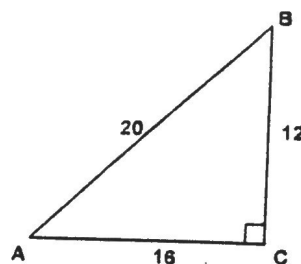
23. $\csc A$

24. $\cot A$

25. $\sec B$

26. $\csc B$

27. $\cot B$



In right triangle HLK, name the ratio represented for the given angle.

28. $\angle H, \frac{17}{15}$

29. $\angle H, \frac{17}{8}$

30. $\angle H, \frac{15}{8}$

31. $\angle K, \frac{17}{15}$

32. $\angle K, \frac{8}{15}$

33. $\angle K, \frac{17}{8}$

