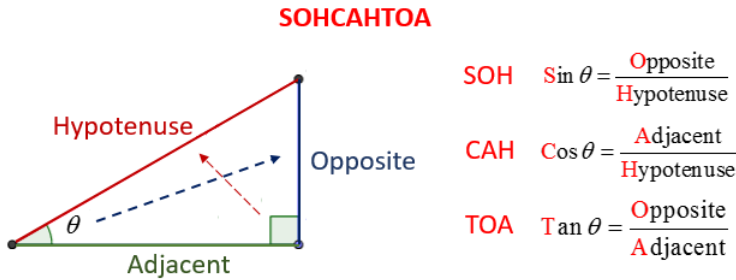


LESSON 1

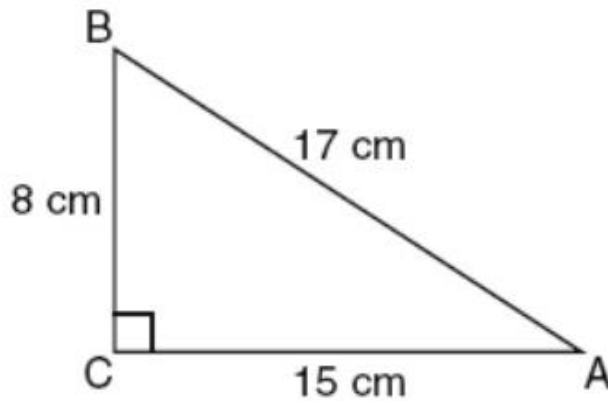
Understanding Sine, Cosine and Tangent.

Trigonometric relationships

- There are six trigonometric ratios, sine, cosine, tangent, cosecant, secant and cotangent.
- These six trigonometric ratios are abbreviated as \sin , \cos , \tan , \csc , \sec , \cot .
- These are referred to as ratios since they can be expressed in terms of the sides of a right-angled triangle for a specific angle θ .



Example 1. Find the sine, cosine, and tangent ratios of angle A.



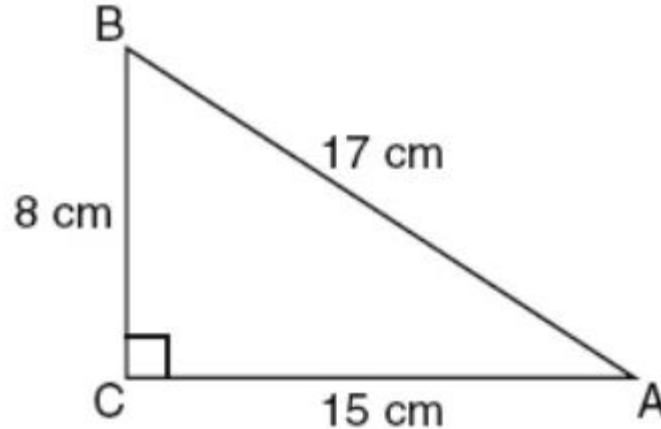
Solution.

$$1. \sin A = \frac{\text{opp}}{\text{hyp}} = \frac{8}{17}$$

$$2. \cos A = \frac{\text{adj}}{\text{hyp}} = \frac{15}{17}$$

$$3. \tan A = \frac{\text{opp}}{\text{adj}} = \frac{8}{15}$$

Example 2. Find the sine, cosine, and tangent ratios of angle B.



Solution.

$$1. \sin B = \frac{\text{opp}}{\text{hyp}} = \frac{15}{17}$$

$$2. \cos B = \frac{\text{adj}}{\text{hyp}} = \frac{8}{17}$$

$$3. \tan B = \frac{\text{opp}}{\text{adj}} = \frac{15}{8}$$

NOTE 1. Sine A = Cosine B.

Since the sum of the angles in a triangle equals 180° , and angle C is 90° , that means the sum of angles A and B equals 90° , that is, they are complementary angles. Therefore, the cosine of B equals the sine of A. The opposite side of angle A is the adjacent side of angle B.

NOTE 2. $\frac{\sin A}{\cos A} = \tan A$

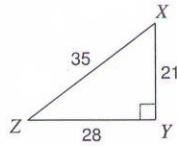
Since $\sin A = \frac{\text{opp}}{\text{hyp}} = \frac{8}{17}$ and $\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{15}{17}$ then,

$$\frac{\frac{\text{opp}}{\text{hyp}}}{\frac{\text{adj}}{\text{hyp}}} = \frac{\text{opp}}{\text{hyp}} \times \frac{\text{hyp}}{\text{adj}} = \frac{\text{opp}}{\text{adj}} = \tan$$

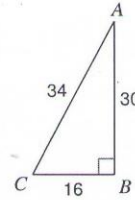
Lesson 1 Exercise

Find the value of each trigonometric ratio.

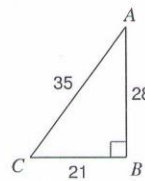
1) $\tan Z$



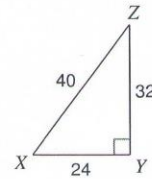
2) $\cos C$



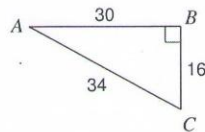
3) $\sin C$



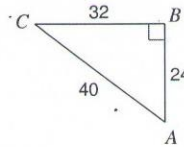
4) $\tan X$



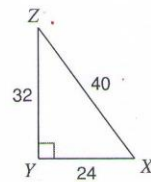
5) $\cos A$



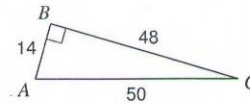
6) $\sin A$



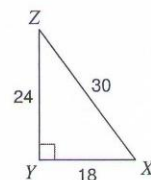
7) $\sin Z$



8) $\sin C$



9) $\cos Z$



10) $\tan C$

