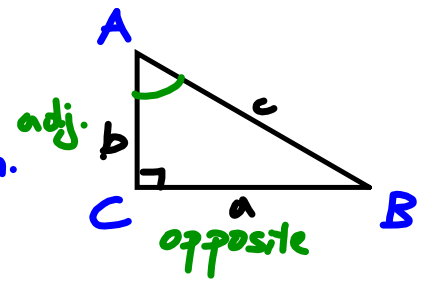


Revisit the Primary Trigonometric Ratios

The word "trigonometry" means measurement of a triangle.

Consider triangle ABC,

- Hypotenuse is the **longest side length.**
- Side AC is the **adjacent** to angle **A**.
- Side BC is the **opposite** to angle **A**.



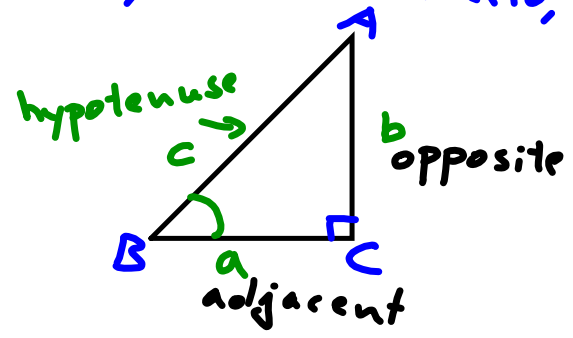
Note: Sides opposite an angle are labelled with a lower case letter associated with the angle. Side a is opposite of <A. Each vertex is labelled with a capital letter.

The sum of the interior angles in a triangle is **180° (<A + <B + <C = 180°)**

The three primary trigonometric ratios are **the sine ratio, the cosine ratio, and the tangent ratio.**  
 Look at <B:

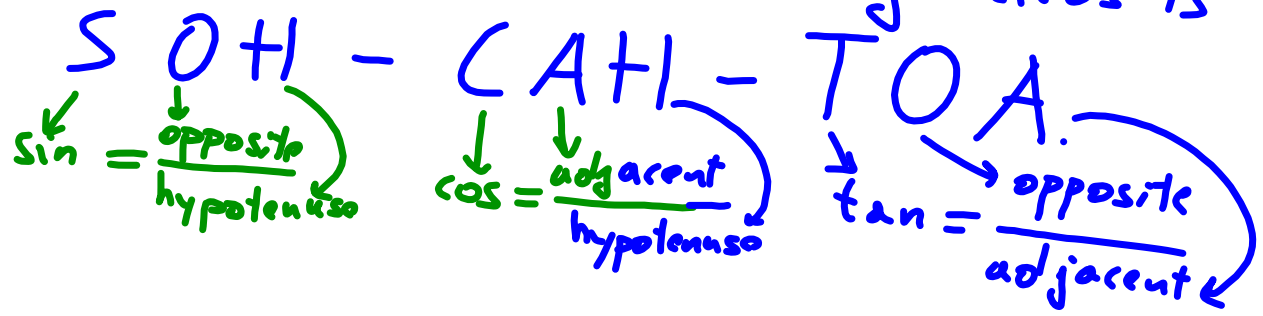
$$\sin B = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{b}{c}$$

$$\cos B = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{a}{c}$$



$$\tan B = \frac{\text{opposite}}{\text{adjacent}} = \frac{b}{a}$$

Another to remember the trig. ratios is

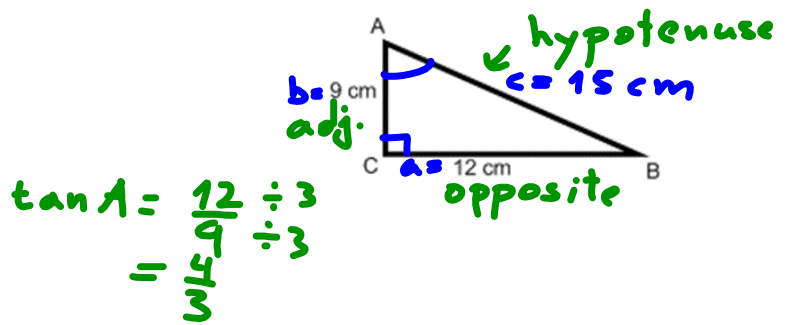


Ex 1: Write the primary trigonometric ratios sin A, cos A, and tan A for  $\triangle ABC$ .

Ans:

$$\sin A = \frac{12}{15} \div 3 = \frac{4}{5}$$

$$\cos A = \frac{9}{15} \div 3 = \frac{3}{5}$$



Ex 2: Evaluate the following.

a)  $\sin 52^\circ \doteq 0.7880$     b)  $\cos 42^\circ \doteq 0.7431$     c)  $\tan 73^\circ \doteq 3.2709$

Ex 3: Find the measure of angle A. (rounded to the nearest angle)

a)  $\sin A = \frac{7}{16}$

$$\angle A = \sin^{-1}\left(\frac{7}{16}\right) \doteq 26^\circ$$

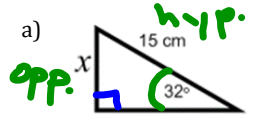
b)  $\cos A = \frac{8}{15}$

$$\angle A = \cos^{-1}\left(\frac{8}{15}\right) \doteq 58^\circ$$

c)  $\tan A = \frac{3}{8}$

$$\angle A = \tan^{-1}\left(\frac{3}{8}\right) \doteq 21^\circ$$

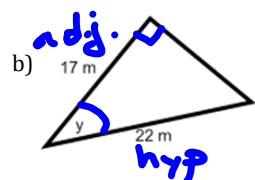
Ex 4: Find the indicated quantities.



$$\sin 32^\circ = \frac{x}{15}$$

$$15 \times \sin 32^\circ = x$$

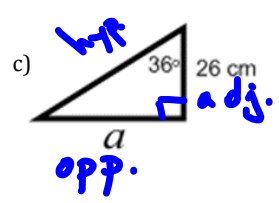
$$\therefore x \doteq 7.9 \text{ cm}$$



$$\cos y = \frac{17}{22}$$

$$y = \cos^{-1}\left(\frac{17}{22}\right)$$

$$\therefore y \doteq 39.4^\circ$$



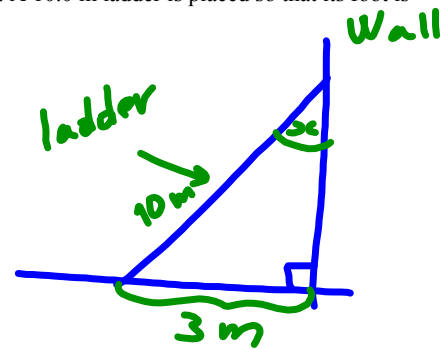
$$\tan 36^\circ = \frac{a}{26}$$

$$26 \times \tan 36^\circ = a$$

$$\therefore a \doteq 18.9 \text{ cm}$$

Ex 5: A ladder is in an unsafe position if it makes an angle of less than  $15^\circ$  with a wall. A 10.0 m ladder is placed so that its foot is 3.0 m from the wall. Is the ladder standing safely?

Solution: - Draw a diagram  
Let  $x$  rep. the angle  
the ladder makes with  
the wall.



$$\text{So, } \sin x = \frac{3}{10}$$

$$x = \sin^{-1}\left(\frac{3}{10}\right)$$

$$\approx 17.5^\circ$$

$\therefore$  The ladder is standing safely since the angle it makes with the wall ( $17.5^\circ$ ) is greater than  $15^\circ$ .

Homework: Pg. 8: #1-4, 7, 13 b, 15