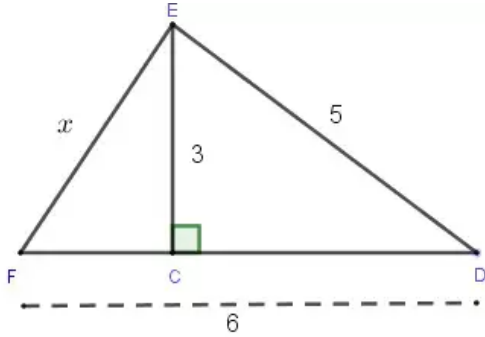


Algebra RH

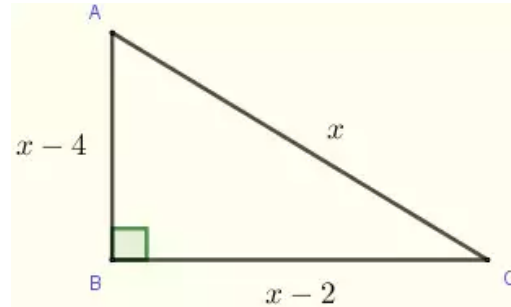
Essential Question: What is trigonometry and how can trig ratios be used to find the missing side of a right triangle?

Do Now:

A) Find the length of \overline{FE} in the figure below.



B) Find the perimeter of the triangle below.



Trigonometry is the branch of mathematics dealing with the relations of the sides and angles of triangles and with the relevant functions of any angles

The reference angle is known as theta, θ .

In a right triangle, θ is never the right angle.

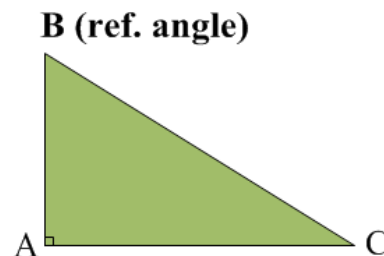
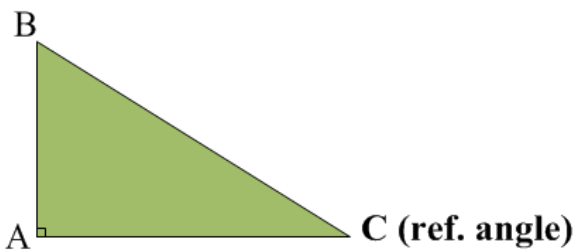
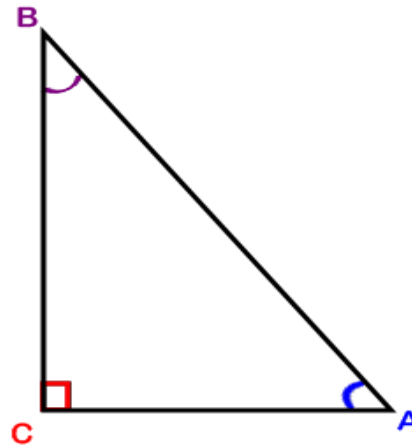
The 3 sides of a right triangle:

Hypotenuse: longest side, opposite the _____

Adjacent: the leg _____ the reference angle

Opposite: the leg _____ the reference angle

Label each side of the triangle - adjacent, hypotenuse, opposite



A trig ratio shows a relationship between two sides of a right triangle and a related angle. An easy way to remember trig ratios is: **SOH CAH TOA**

Sine Ratio

$$\sin x = \frac{\text{opposite}}{\text{hypotenuse}}$$

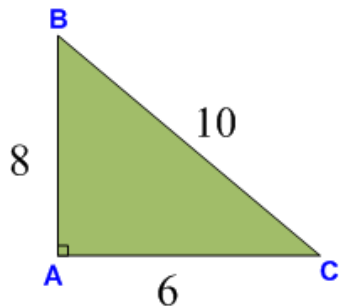
Cosine Ratio

$$\cos x = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Tangent Ratio

$$\tan x = \frac{\text{opposite}}{\text{adjacent}}$$

Fill in the table by writing the correct trigonometric ratios

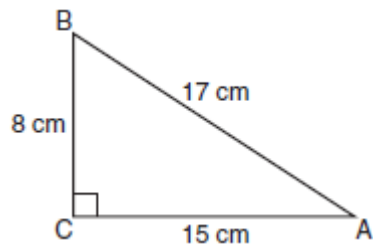


| | | |
|---------|---------------|--|
| Sin B = | $\frac{o}{h}$ | |
| Cos B = | $\frac{a}{h}$ | |
| Tan B = | $\frac{o}{a}$ | |

| | | |
|---------|---------------|--|
| Sin C = | $\frac{o}{h}$ | |
| Cos C = | $\frac{a}{h}$ | |
| Tan C = | $\frac{o}{a}$ | |

Practice Problem Set

1) Which equation shows a correct trigonometric ratio for angle A in the right triangle below?



A) $\sin A = \frac{15}{17}$

B) $\tan A = \frac{8}{17}$

C) $\cos A = \frac{15}{17}$

D) $\tan A = \frac{15}{8}$

2) In $\triangle ABC$, $m\angle C = 90^\circ$. If $AB = 5$ and $C = 4$, then which of the following is not true?
Draw a picture!

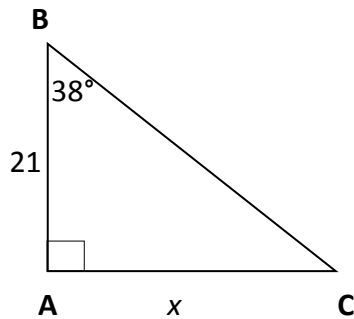
A) $\cos A = \frac{4}{5}$

B) $\tan A = \frac{3}{4}$

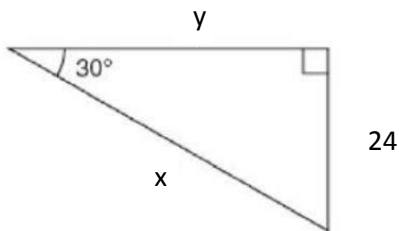
C) $\sin B = \frac{4}{5}$

D) $\tan B = \frac{5}{3}$

3) Find the missing side in the right triangle and round your answer to the *nearest tenth*.

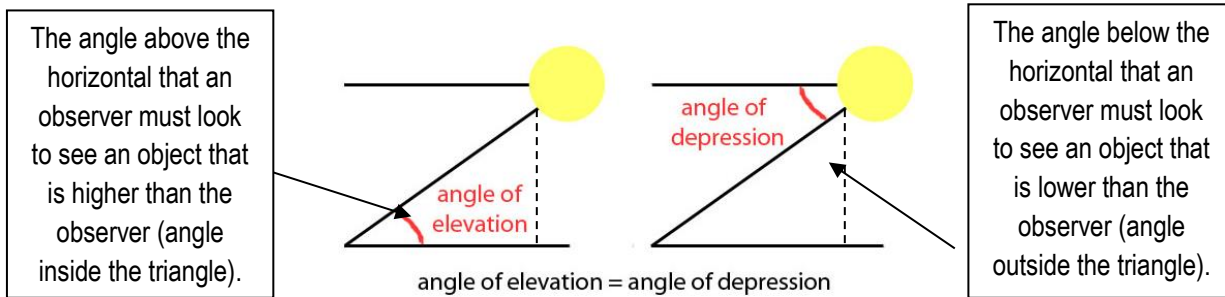


4) Find the perimeter of the right triangle to the nearest tenth



Solving Trigonometry Word Problems

- Make a diagram of the situation (if one is not given)
- Label the sides of the right triangle using the information in the problem
- Decide which trigonometric ratio to use
- Solve for the missing side or angle
- Answer the question (pay attention to rounding directions & remember units)
- Sometimes an angle can be referred to as an angle of elevation or an angle of depression. This depends on the angle of sight of an observer.



5) A ladder is leaning against a building. The foot of the ladder is 12 feet away from the base of the building. If the angle that the ladder makes with the ground is 62° , at what height does the ladder touch the building? Round your answer to the *nearest hundredth*.

6) A 40 foot long wire is attached from a stake in the ground to the top of a pole. The angle it makes with the ground is 37° . How far away from the base of the pole is the stake? Round to the *nearest hundredth*.

7) A ramp is at an incline of 18° . If the ramp is 7 meters long, at what vertical height is the incline?

8) A building is 50 feet high. At a distance away from the building, an observer notices that the angle of elevation to the top of the building is 41° . To the *nearest tenth*, how far is the observer from the base of the building?

9) From the top of an apartment building, the angle of depression to a parked car on the street is 38° , as shown in the diagram below. The car is parked 80 feet from the base of the building. Find the height of the building to the *nearest tenth of a foot*.

