

Name: _____

Teacher: _____

UNIT 8 HOMEWORK PACKET - RIGHT TRIANGLE TRIGONOMETRY

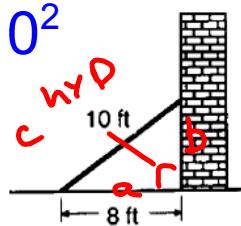
****BE SURE YOUR CALCULATOR IS IN DEGREE MODE****

Lesson 1 Homework - Pythagorean Theorem

1. A 10-foot ladder is placed against the side of a building as shown in figure 1 below. The bottom of the ladder is 8 feet from the base of the building. In order to increase the reach of the ladder against the building, it is moved 4 feet closer to the base of the building as shown in figure 2. To the *nearest foot*, how much further up the building does the ladder now reach? Show how you arrived at your answer.

$$8^2 + b^2 = 10^2$$

$$b = 6 \text{ feet}$$



$$9 - 6 = 3$$

Figure 1

$$4^2 + b^2 = 10^2$$

$$b \approx 9 \text{ feet}$$

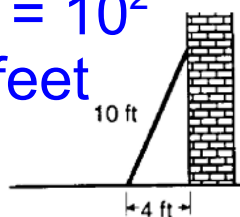
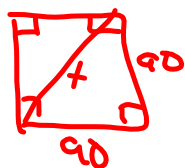


Figure 2

it reaches about 3 feet farther up the building

2. A baseball diamond is a square with sides of 90 feet. What is the shortest distance, to the *nearest tenth* of a foot, between home plate and second base?

$$x \approx 127.3$$



$$90^2 + 90^2 = x^2$$

3. The measures of three sides of a triangle are 9, 16, and 20. Determine whether the triangle is a right triangle. Explain your answer.

this is NOT a right triangle because the side lengths do not work in the pyth. theorem.

$$9^2 + 16^2 \neq 20^2$$



4. A cable 20 feet long connects the top of a flagpole to a point on the ground that is 16 feet from the base of the pole. How tall is the flagpole?

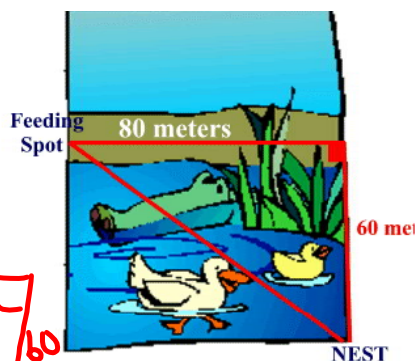
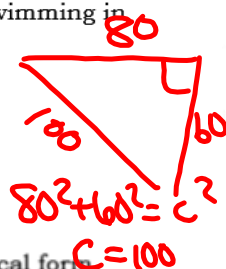
$$16^2 + b^2 = 20^2$$

$$b = 12 \text{ feet}$$



5. Daisy Duck has a nest on the edge of the pond. She can either waddle on land around the pond to the nest (80 meters by 60 meters), or she can swim across the pond to the nest. Daisy waddles more quickly than she swims. She waddles at the rate of 30 m/min and she swims at the rate of 20 m/min. Which route is quicker to travel from the feeding spot to the nest- waddling on land or swimming in the pond?

W: $80+60=140m$
 $\frac{140}{30}=4.7min$
 Swin: $\frac{100}{20}=5min$
 waddling is quicker



7. Find the value of x . Leave your answer in radical form.

$$1^2 + 1^2 = x^2$$

$$\sqrt{2} = x$$

$$x = \sqrt{2}$$

$$1^2 + \sqrt{2}^2 = x^2$$

$$1 + 2 = x^2$$

$$\sqrt{3} = x$$

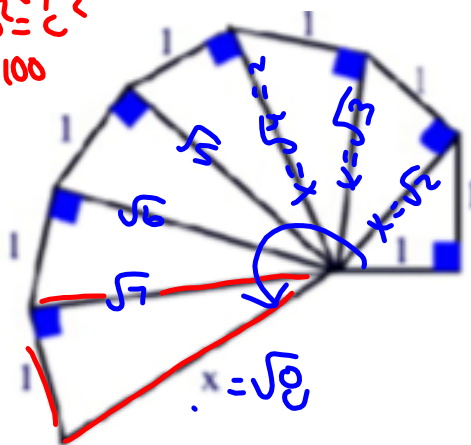
$$\sqrt{3} = x$$

$$1^2 + \sqrt{3}^2 = x^2$$

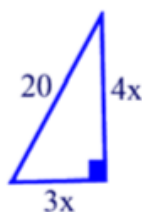
$$1 + 3 = x^2$$

$$\sqrt{4} = x$$

$$2 = x$$



8. Find the value of x .



$$x = 4$$

$$x = \sqrt{8} \text{ or } 2\sqrt{2}$$

$$(4x)^2 + (3x)^2 = 20^2$$

$$16x^2 + 9x^2 = 400$$

$$\frac{25x^2}{25} = \frac{400}{25}$$

$$x^2 = 16$$

$$x = 4$$

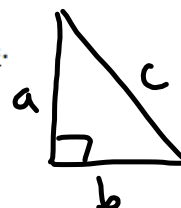
Lesson 2: Introduction to Trigonometry

(BE SURE THAT YOUR CALCULATOR IS IN DEGREES)

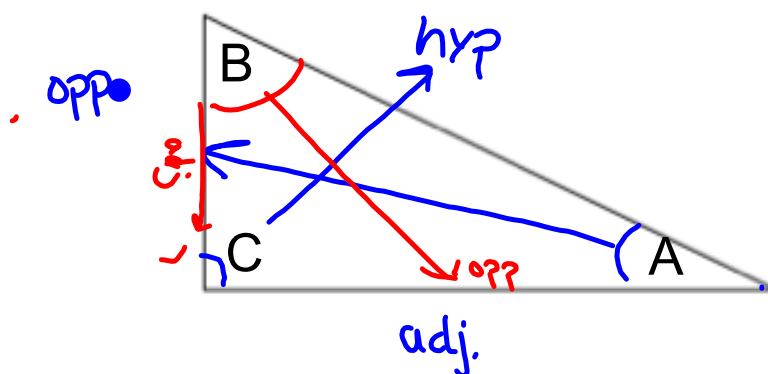
For right triangles, you already know that the *hypotenuse* is the side across from the right

Now, we also have names for the other sides of a right that relate to a given angle.

- side *opposite* the given angle,
- the side *adjacent* to (or next to) the given angle



- With white-board marker, label angles A, B & C on both sides!
- On one side, label the adj and opp from angle A
- On one side, label the adj and opp from angle B



Trigonometric Ratios**SINE**

$$\sin(\text{angle}) = \frac{\text{opposite}}{\text{hypotenuse}}$$

COSINE

$$\cos(\text{angle}) = \frac{\text{adjacent}}{\text{hypotenuse}}$$

TANGENT

$$\tan(\text{angle}) = \frac{\text{opposite}}{\text{adjacent}}$$

These trigonometric ratios are based on similar triangles (as you saw in your table!) You need to memorize the name for each of those ratios. Think: SOH – CAH – TOA

S $\frac{O}{H}$ C $\frac{A}{H}$ T $\frac{O}{A}$

REMEMBER: The ratios depend on the given angle.

If you change the given angle, the ratio will change as well!

Soh Cah Toa

$$S \frac{O}{H}$$

$$C \frac{A}{H}$$

$$T \frac{O}{A}$$

Oh Heck Another Hour Of Algebra

$$\frac{O}{H}$$

$$\frac{A}{H}$$

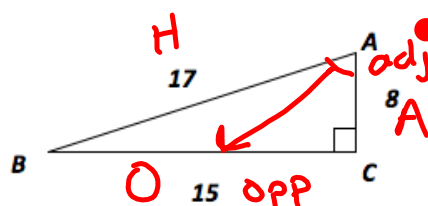
$$\frac{O}{A}$$

1. Using the triangle to the below, find the following ratios. DO NOT use your calculator – write the ratio as a fraction.

a) $\sin A = \frac{O}{H} = \frac{15}{17}$

b) $\cos A = \frac{A}{H} = \frac{8}{17}$

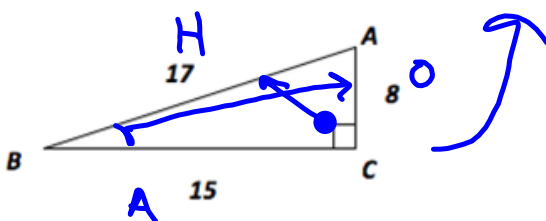
c) $\tan A = \frac{O}{A} = \frac{15}{8}$



d) $\sin B = \frac{O}{H} = \frac{8}{17}$

e) $\cos B = \frac{A}{H} = \frac{15}{17}$

f) $\tan B = \frac{O}{A} = \frac{8}{15}$



S O (A T O)

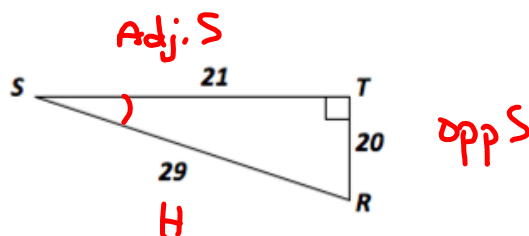
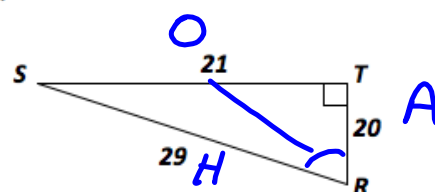
2. Using the triangle to the right, find the:

a) $\sin R = \frac{O}{H} = \frac{21}{29}$

b) $\cos R = \frac{A}{H} = \frac{20}{29}$

c) $\tan S = \frac{O}{A} = \frac{20}{21}$

SOH CAH TOA



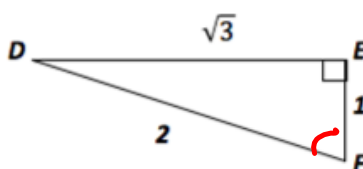
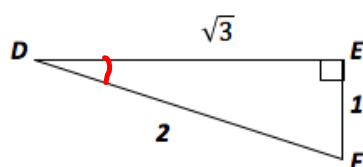
3. Using the triangle to the right, find the:

a) $\sin D = \frac{1}{2}$

b) $\cos D = \frac{\sqrt{3}}{2}$

c) $\tan F = \frac{\sqrt{3}}{1} = \sqrt{3}$

c) $\cos F = \frac{1}{2}$



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10 is tricky, write down what cosine means and
you will figure it out!

