

Unit 5 Trig Review

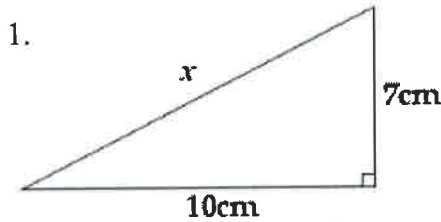
Name: Key Class: \_\_\_\_\_

This will be graded. Use your notes if needed. All of this information was on your last quiz and will be on this week's test.

Background Info:

- State the Pythagorean Theorem:  $a^2 + b^2 = c^2$
- What do you know about side "c"? always the longest side (in a right Δ, it is the hypotenuse)
- What word do we use to remember the trig ratios? S<sup>o</sup>HC<sup>A</sup>HT<sup>A</sup> or Sohcahtoa
- State the trig ratios for each of the following:
  - Sine:  $\frac{\text{opposite}}{\text{hypotenuse}}$
  - Cosine:  $\frac{\text{adjacent}}{\text{hypotenuse}}$
  - Tangent:  $\frac{\text{opposite}}{\text{adjacent}}$

Part 1: Pythagorean Theorem – REMEMBER TO WRITE THE UNITS

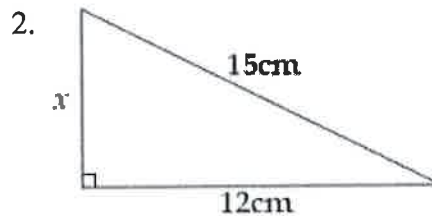


$$10^2 + 7^2 = x^2$$

$$149 = x^2$$

$$x = \sqrt{149}$$

X =  $\approx 12.2 \text{ cm}$



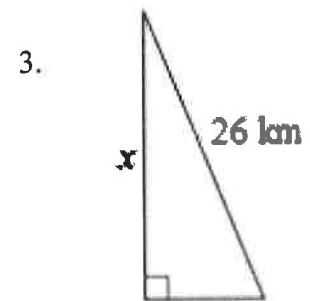
$$x^2 + 12^2 = 15^2$$

$$x^2 + 144 = 225$$

$$x^2 = 81$$

$$x = \sqrt{81}$$

X =  $9 \text{ cm}$



$$x^2 + 10^2 = 26^2$$

$$x^2 + 100 = 676$$

$$x^2 = 576$$

$$x = \sqrt{576} = 24 \text{ km}$$

X =  $24 \text{ km}$

Part 2: Converse of the Pythagorean Theorem – Determine if the triangle is right, acute, or right. Also state if it is a scalene, isosceles, or equilateral triangle. (You should have TWO names for each)

4. Sides: 4, 8, 11

$$11^2 \square 4^2 + 8^2$$

$$121 \square 80$$

$\square$  means less than

**Obtuse, Scalene**

5. Sides: 19, 31, 27

$$31^2 \square 19^2 + 27^2$$

$$961 \square 1090$$

$\square$  means less than

**Acute, Scalene**

6. Sides: 18, 10, 13

$$18^2 \square 10^2 + 13^2$$

$$324 \square 269$$

$\square$  means less than

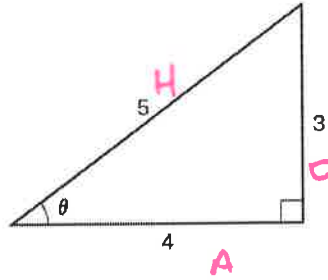
**Obtuse, Scalene**

**Part 3: Determine all of the trigonometric ratios for the triangles provided. Be sure to simplify and show all work when finding missing sides!**

7.  $\sin \theta = \frac{3}{5}$

$\cos \theta = \frac{4}{5}$

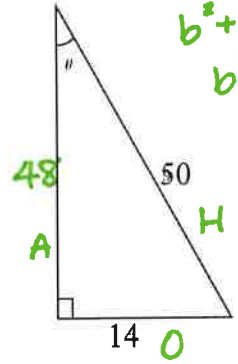
$\tan \theta = \frac{3}{4}$



8.  $\sin \theta = \frac{14}{50} = \frac{7}{25}$

$\cos \theta = \frac{48}{50} = \frac{24}{25}$

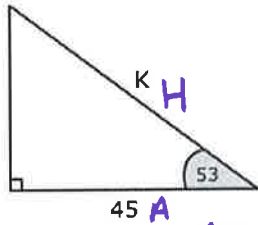
$\tan \theta = \frac{14}{48} = \frac{7}{24}$



$b^2 + 14^2 = 50^2$   
 $b^2 + 196 = 2500$   
 $b^2 = 2304$   
 $b = 48$  units

**Part 4: Find the missing side or angle indicated in each triangle. SHOW ALL OF YOUR WORK!! Round to the nearest tenth when needed.**

9.



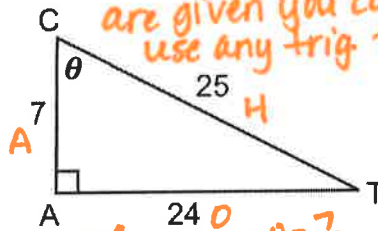
$\cos(53) = \frac{45}{K}$

$K \cdot \cos(53) = 45$

$K = \frac{45}{\cos(53)}$

$K \approx 74.8$  units

10. *since all sides are given you can use any trig. fxn!*



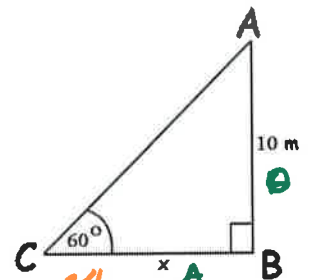
$\sin(\theta) = \frac{24}{25}$  or  $\cos \theta = \frac{7}{25}$

$\theta = \sin^{-1}(\frac{24}{25})$  or  $\theta = \cos^{-1}(\frac{7}{25})$

$\theta \approx 73.7^\circ$  or  $\theta \approx 73.7^\circ$

$\approx 73.7^\circ$

11.



$\tan \theta = \frac{24}{7}$

$\tan(60) = \frac{10}{x}$

$\theta = \tan^{-1}(\frac{24}{7})$

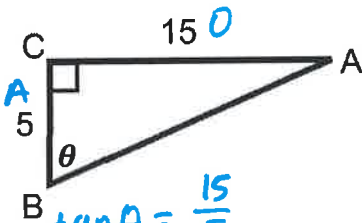
$x \cdot \tan(60) = 10$

$\theta \approx 73.7^\circ$

$x = \frac{10}{\tan(60)}$

$x \approx 5.8$  m

12.

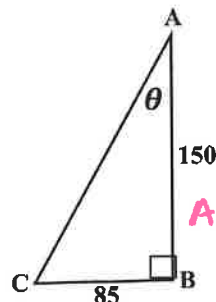


$\tan \theta = \frac{15}{5}$

$\theta = \tan^{-1}(\frac{15}{5})$

$\theta \approx 71.6^\circ$

13.

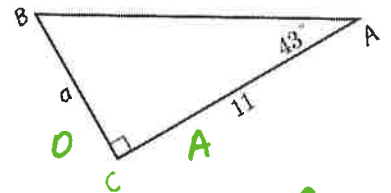


$\tan \theta = \frac{85}{150}$

$\theta = \tan^{-1}(\frac{85}{150})$

$\theta \approx 29.5^\circ$

14.

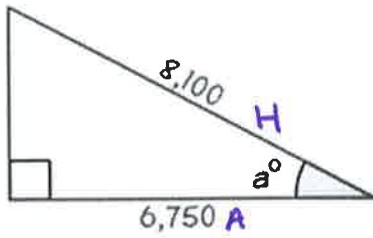


$\tan(43) = \frac{a}{11}$

$a = 11 \tan(43)$

$a \approx 10.3$  units

15.

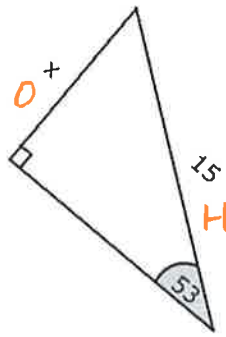


$$\cos(a) = \frac{6750}{8100}$$

$$a = \cos^{-1}\left(\frac{6750}{8100}\right)$$

$$a \approx 33.6^\circ$$

16.

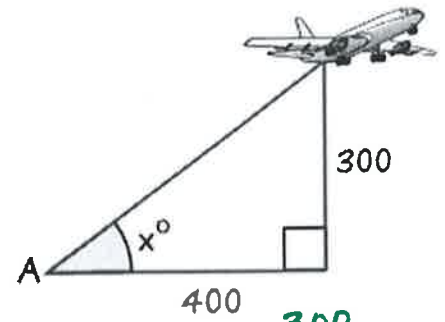


$$\sin(53) = \frac{x}{15}$$

$$x = 15 \sin(53)$$

$$x \approx 12.0 \text{ units}$$

17.



$$\tan(x) = \frac{300}{400}$$

$$x = \tan^{-1}\left(\frac{300}{400}\right)$$

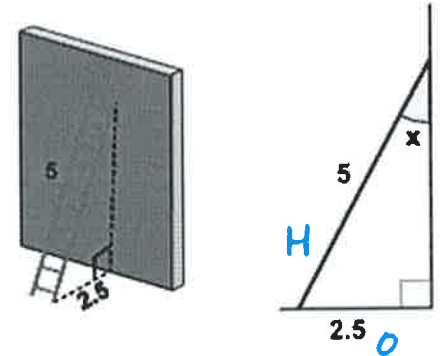
$$x \approx 36.9^\circ$$

### Part 5: Extension (Looking ahead)

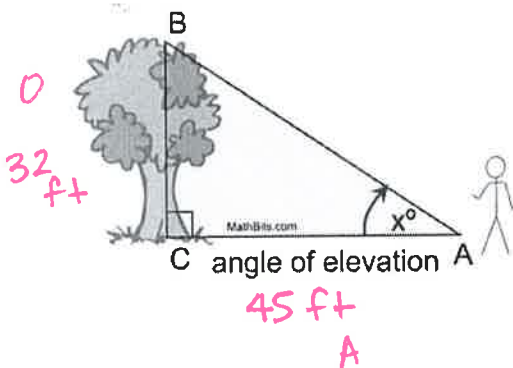
18. A ladder leaning against a wall is pictured to the right. Calculate the angle that the ladder makes with the wall. (To help you there is another picture provided illustrating the triangle you will need to use.)

$$\sin(x) = \frac{2.5}{5}$$

$$x = \sin^{-1}\left(\frac{2.5}{5}\right) = 30^\circ$$



19. If the person shown in the picture is standing 45 feet away from the bottom of the tree and the tree is 32 feet tall, then determine the degree of angle  $x$ .



$$\tan(x) = \frac{32}{45}$$

$$x = \tan^{-1}\left(\frac{32}{45}\right)$$

$$x \approx 35.4^\circ$$

20. Find  $b$  in the diagram on the right. (Note: You will need to find  $\overline{AB}$  first!)

$$\tan(48) = \frac{x}{86}$$

$$x = 86 \tan(48)$$

$$x \approx 95.5 \text{ m}$$

$$\sin(51) = \frac{b}{\text{Ans}}$$

$$b = \text{Ans} \cdot \sin(51)$$

$$b \approx 74.2 \text{ m}$$

