

Simplify all answers and show your work!

- 1) The Pythagorean Theorem can only be used with right triangles.
 2) There are 60 seconds in one minute. 3) There are 3600 seconds in one degree.
 4) Using the terms “opposite”, “adjacent”, and “hypotenuse”, define the following:

a) $\cot A = \frac{\text{adjacent}}{\text{opposite}}$

b) $\sec A = \frac{\text{hypotenuse}}{\text{adjacent}}$

c) $\csc A = \frac{\text{hypotenuse}}{\text{opposite}}$

- 5) If $\triangle ABC \sim \triangle EDC$ where $m\angle A = 90^\circ$, $\overline{AB} = 5$, $\overline{DE} = 6$, $\overline{CE} = 8$, find the following.

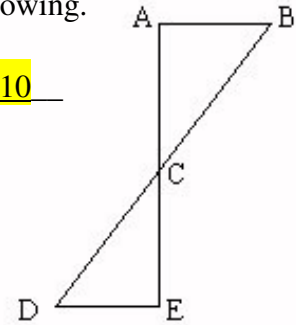
a) the length $\overline{AC} = \underline{6.7}$

b) $m\angle E = \underline{90^\circ}$

c) the length $\overline{CD} = \underline{10}$

d) the length $\overline{BC} = \underline{8.3}$

e) $m\angle D = \underline{53.1^\circ}$



f) $m\angle B = \underline{53.1^\circ}$

g) $m\angle DCE = \underline{36.9^\circ}$

f) $m\angle ACB = \underline{36.9^\circ}$

- 6) A flagpole casts a shadow 99 meters long at the same time that a pole 10 meters tall casts a shadow 18 meters long. Find the height of the flagpole.

55 meters

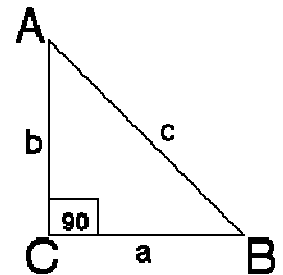
Use the right triangle below to answer questions 9 – 14.

- 7) If $b = 13$ and $c = 17$, find $\sin B$.

$\frac{13}{17}$

- 8) If $a = 3$ and $b = 4$, find $\cos A$.

$\frac{4}{5}$



- 9) If $m\angle B = 41^\circ$, and $c = 15$, find a .

11.32

- 10) If $\sin B = 0.345$ and $c = 11.2$, find b .

3.864

- 11) If $a = 4$ and $b = 11$, find $m\angle A$.

20°

- 12) If $a = 4.6$ and $c = 8.2$, find $m\angle B$.

55.9°

13) Convert $113^{\circ} 15' 25''$ to decimal notation.

113.257°

14) Convert 15.84° to degrees, minutes, and seconds.

15° 50' 24"

Find the following.

15) $\sin 24.6^{\circ}$

0.4163

16) $\tan 84.3^{\circ}$

10.0187

17) $\csc 43.9^{\circ}$

1.4422

18) $\cot 58^{\circ}$

0.6249

Solve for x:

18) $\sin 43^{\circ} = \frac{x}{7.2}$

4.9104

19) $\sec x = 2.97$

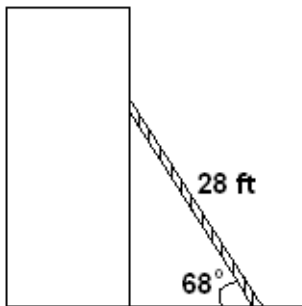
70.324°

20) $\cot 24^{\circ} = \frac{5.9}{x}$

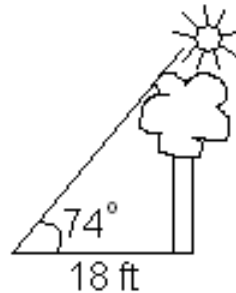
2.6268

For 21 and 22, draw a picture to represent the following scenarios.

21) A 28-ft ladder leans against a building at an angle of 68° .



22) The angle of elevation of the sun is 74° , and causes a tree to cast an 18-foot shadow.



Solve the following problems using right triangle trigonometry.

23) What is the angle of elevation of the sun from the ground when a 6-ft man casts a shadow of 14 feet?

23.2°

24) From a 60-foot observation tower on the coast, a Coast Guard officer sights a boat in difficulty. The angle of depression is 3 degrees. How far is the boat from the shoreline?

1144.9 feet

25) A surveyor is standing 35 feet from the base of a large tree. The surveyor measures the angle of elevation to the top of the tree as 71.5° . How tall is the tree?

104.6 feet