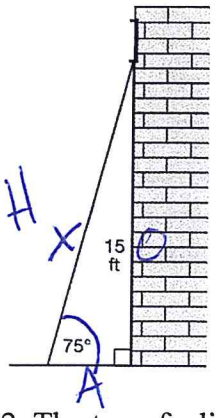
Name Schlansky
Mr. Schlansky

Date _____
Geometry

Right Triangles Word Problems

1. In the diagram below, a window of a house is 15 feet above the ground. A ladder is placed against the house with its base at an angle of 75° with the ground. Determine and state the length of the ladder to the *nearest tenth of a foot*.



$\sin\theta = \frac{O}{H}$

$\sin 75 = \frac{15}{x}$

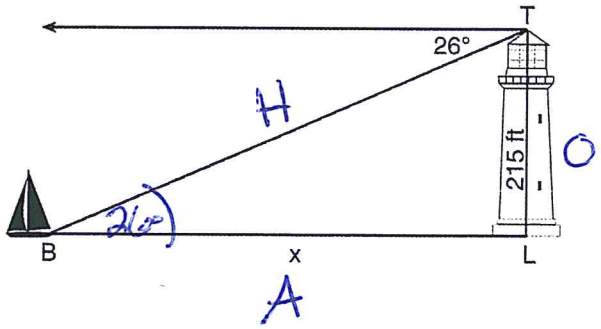
$\frac{.9659}{1} = \frac{15}{x}$

$.9659x = 15$

$\frac{.9659x}{.9659} = \frac{15}{.9659}$

$x = 15.5$

2. The top of a lighthouse, T, is 215 feet above sea level, L, as shown in the diagram below. The angle of depression from the top of the lighthouse to a boat, B, at sea is 26°. Determine, to the *nearest foot*, the horizontal distance, x, from the boat to the base of the lighthouse.



$\tan\theta = \frac{O}{A}$

$\tan 26 = \frac{215}{x}$

$\frac{.4877}{1} = \frac{215}{x}$

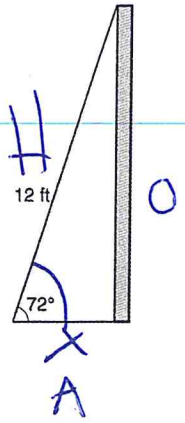
$.4877x = 215$

$\frac{.4877x}{.4877} = \frac{215}{.4877}$

$x = 441$

3. As shown in the diagram below, a ladder 12 feet long leans against a wall and makes an angle of 72° with the ground.

Find, to the *nearest tenth of a foot,* the distance from the wall to the base of the ladder.



$\cos\theta = \frac{A}{H}$

$\cos 72 = \frac{x}{12}$

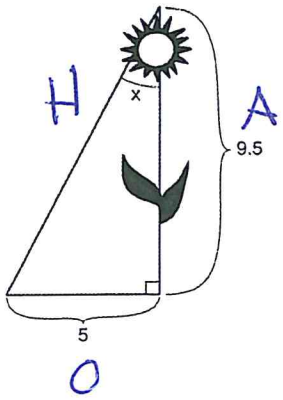
$\frac{.3090}{1} = \frac{x}{12}$

$x = 3.7$

4. The diagram below shows the path a bird flies from the top of a 9.5-foot-tall sunflower to a point on the ground 5 feet from the base of the sunflower.

To the *nearest tenth of a degree*, what is the measure of angle x?

~~1)~~ 27.8
2) 31.8
3) 58.2
4) 62.2

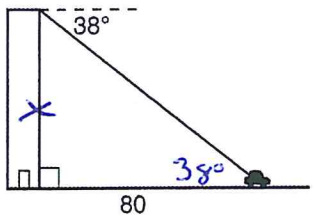


$\tan\theta = \frac{O}{A}$ $x = 27.8$

$\tan^{-1}\tan x = \frac{5}{9.5}$ $\tan^{-1}$

$x = \tan^{-1}\frac{5}{9.5}$

5. From the top of an apartment building, the angle of depression to a car parked on the street below is 38 degrees, 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*.



$\tan\theta = \frac{O}{A}$

$\tan 38 = \frac{x}{80}$

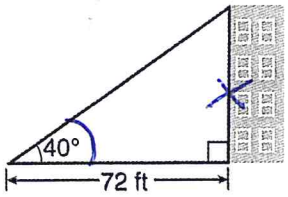
$\frac{.7813}{1} = \frac{x}{80}$

$x = 62.5$

6. As shown in the diagram below, a building casts a 72-foot shadow on the ground when the angle of elevation of the Sun is 40°.

How tall is the building, to the *nearest foot*?

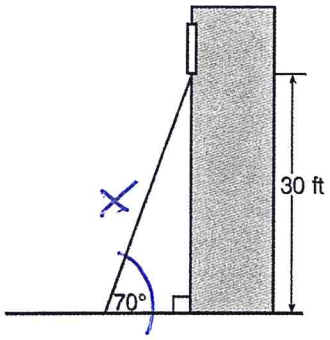
1) 46
~~2)~~ 60
3) 86
4) 94



$\tan\theta = \frac{O}{A}$ $\frac{.8391}{1} = \frac{x}{72}$

$\tan 40 = \frac{x}{72}$ $x = 60$

7. A carpenter leans an extension ladder against a house to reach the bottom of a window 30 feet above the ground. As shown in the diagram below, the ladder makes a 70° angle with the ground. To the *nearest foot*, determine and state the length of the ladder.



$\sin\theta = \frac{O}{H}$

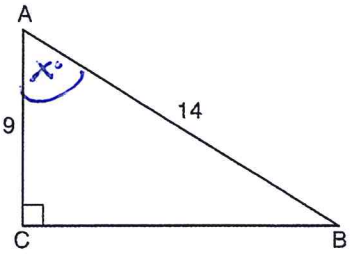
$\sin 70 = \frac{30}{x}$

$\frac{.9397}{1} = \frac{30}{x}$

$\frac{.9397x}{.9397} = \frac{30}{.9397}$

$x = 32$

8. In the diagram of right triangle ABC shown below, $AB = 14$ and $AC = 9$.



What is the measure of $\angle A$, to the *nearest degree*?

1) 33
2) 40
3) 50
4) 57

$\cos\theta = \frac{A}{H}$

$\cos^{-1}\cos x = \cos^{-1}\frac{9}{14}$

$x = \cos^{-1}\left(\frac{9}{14}\right)$

$x = 50°$