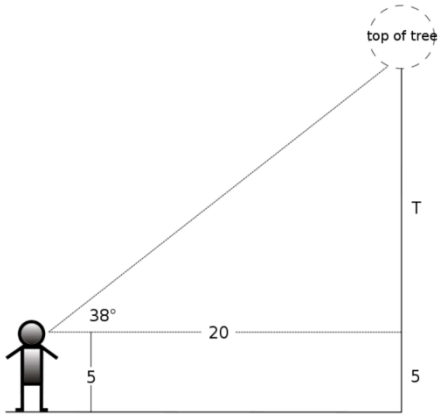
Name: _____

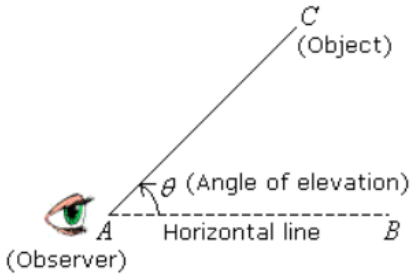
Period: _____

Common Core Standard

HSG-SRT.C.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems

Trigonometry Three-Level Challenge Level I





The diagram at right illustrates $\angle CAB$ which is the angle of elevation $\theta = 38°$, of an observer.
The left diagram illustrates Jesus who is observing a tree from 20 feet away.
Find the answers to the following questions to the nearest whole number.

1. Jesus's eye level height is 5 feet and he is standing 20 feet away from the tree. Find the height of the tree to the nearest foot when the angle of elevation is $38°$. Hint: Remember to include the eye level height. 1. _____

2. Calculate the new angle of elevation after he walked the 5 feet towards the tree. Hint: Use only values that are on the triangle. 2. _____

3. Find the distance from the point where he is now standing to the top of the tree. 3. _____

4. Find the angle of elevation when he is 12 feet away from the base of the tree and he is 15 feet away the top of the tree. 4. _____

5. When the angle of elevation changes from $38°$ *to* $50°$, how much closer is he from the original 20 feet where he started? Hint: Find the difference between new calculation and the original given distance. 5. _____