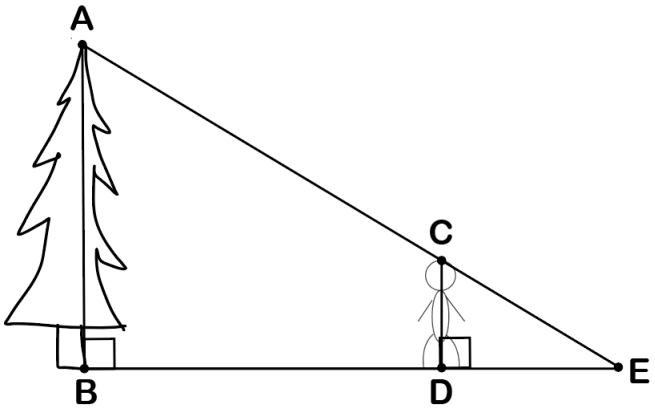
2. Another way to measure the height of a tree using its shadow is for the measure to walk away from the tree along its shadow until their head is in line with the top of the tree and the tip of the shadow.

a) Why is $\Delta ABE \sim \Delta CDE$?

Because of AA. $\angle E = \angle E$ because it's the same angle (reflexive property), and $\angle ABD = \angle CDE$ because they are both right angles.

b) Suppose that $CD = 6\ ft$, $BD = 20ft$, and $DE = 10\ ft$. How tall is the tree?

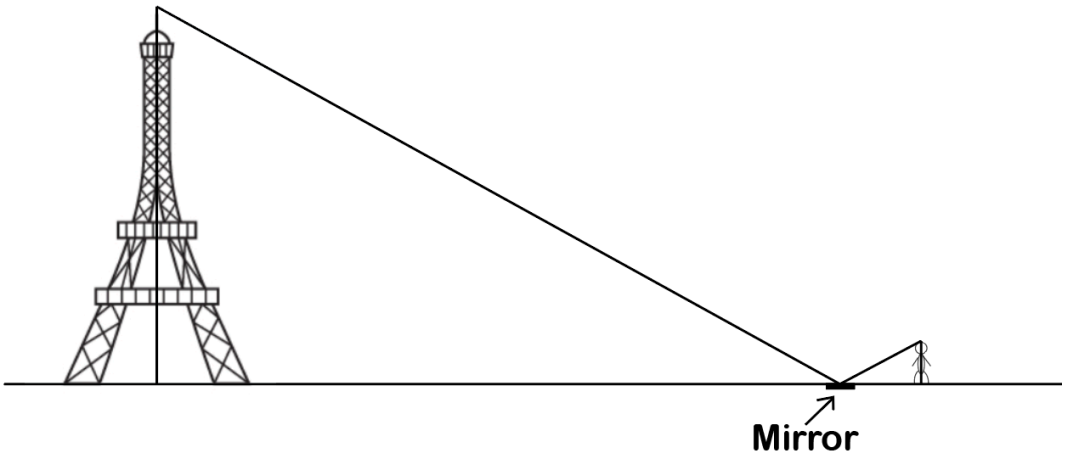
$18\ ft$



4. To find the height of the Eiffel Tower, Antoine placed a mirror 500 meters away from the tower. He then positions himself as shown so that the top of the tower is visible in the mirror. He is standing 2.75 meters from the mirror and his eyes are 1.8 meters off the ground.

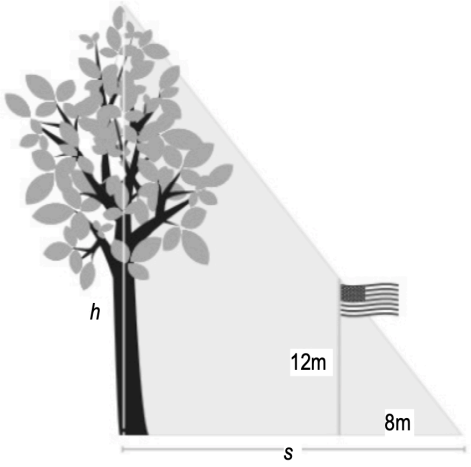
How tall is the tower? Justify your use of similar triangles to answer this question.

$327\ ft$ Similar triangles is justified because of AA. Both objects are at right angles from the ground, and the mirror produces two equal angles (angle in equals the angle out)


Mirror

4. Annie places a mirror 19 feet from a tree and then walks backwards in a straight line until she can see the top of the tree in the center of the mirror. She notices that she is 38 inches from the mirror. Annie knows that she is 6 feet tall (72 inches), but that her eyes are about five inches lower than that when she is looking at the mirror (67 inches). How tall is the tree?

At a certain time of day, a 12 meter flagpole casts an 8m shadow. Write an equation that would allow you to find the height, *h*, of the tree that uses the length, *s*, of the tree's shadow.


h
12m
8m
s