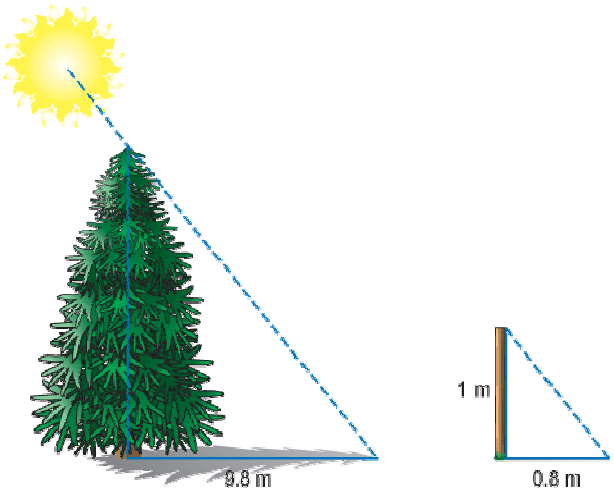
Lesson 7-7

Problem

A tree casts a shadow 9.8 meters long. A meter stick placed perpendicular to the ground at the same time of day casts a shadow that is 0.8 meter long. How tall is the tree?



Solution

A sketch of the problem shows that the tree, the sun's rays, and the shadow form a right triangle similar to the triangle formed by the meter stick and its shadow.

Let h represent the height of the tree. Because the triangles are similar, $1 : h = 0.8 : 9.8$. By cross multiplying, you get $0.8h = 9.8$ and $h = 12.25$. Therefore, the tree is 12.25 meters high. By using indirect measurement, you avoided having to climb the tree with a measuring tape.