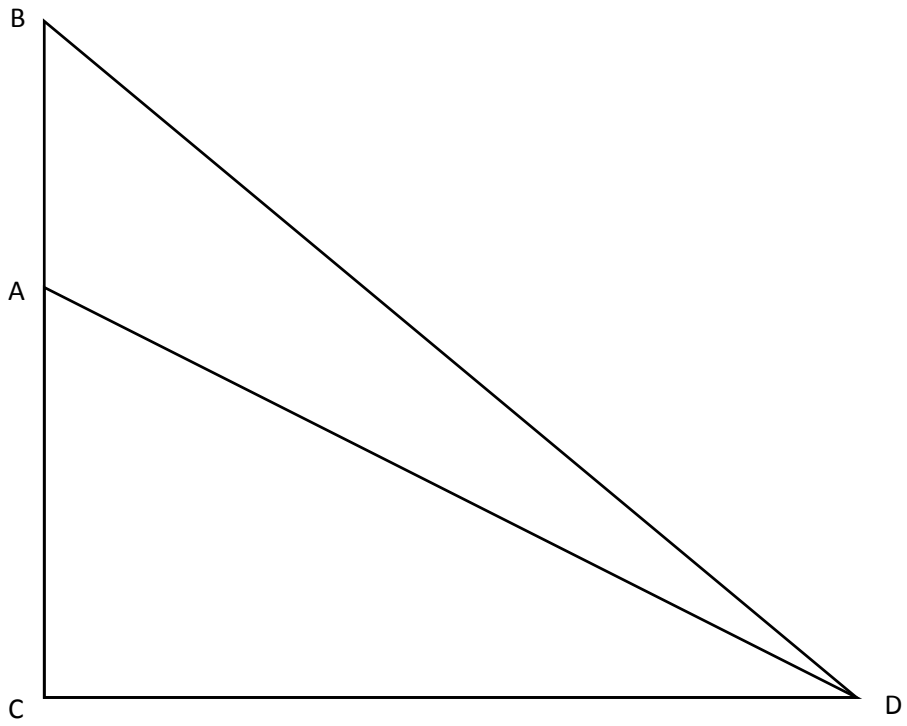
Answer on question 34175 – Math – Geometry

The City of Manila has an ordinance stating that business signs may be no more than 6 feet tall. Bill's Boots erected a boot–shaped sign high above the ground. Having no ladder, Jiggerface, a code enforcement officer, measured the height of the sign by measuring the angles of elevation to the bottom and top of the sign. Standing 10 feet away from the base of the sign, he measured the angle to the bottom of the sign to be 68.2° and the angle to the top of the sign to be 72.3°. How tall is the sign? Is the sign within the code restrictions or not

Answer:



The height of the sign is AB. $\angle ADC = 68.2, \angle BDC = 72.3$. The triangles ADC and BDC are right triangles. Using the definition of tan we obtain

$$AC = CD * \tan 68.2 = 10 * \tan 68.2 \approx 25\ feet;$$

$$BC = CD * \tan 72.3 = 10 * \tan 72.3 \approx 31.3\ feet$$

$$AB = BC - AC \approx 6.3\ feet$$

Answer: the height of the sign is 6.3 feet. It is not within the code restrictions.