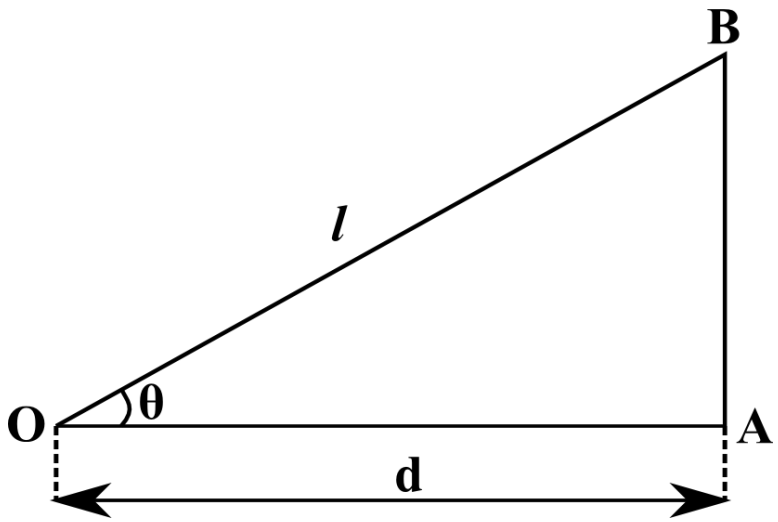
Answer on Question 61932, Physics, Mechanics, Relativity

Question:

A ladder $7.85\ m$ long leans against the side of a building. If the ladder is inclined at an angle of 66.5° to the horizontal, what is the horizontal distance from the bottom of the ladder to the building?

Solution:

Here's the sketch of our problem:



Let $l = 7.85\ m$ is the length of the ladder, $\theta = 66.5^{\circ}$ is the angle at which the ladder inclined to the horizontal and d is the horizontal distance from the bottom of the ladder to the building. Then, we can find d from the right triangle OAB:

$$cos\theta = \frac{OA}{OB} = \frac{d}{l}.$$

From this formula we can find the horizontal distance from the bottom of the ladder to the building:

$$d = l \cdot cos\theta = 7.85\ m \cdot cos66.5^{\circ} = 3.13\ m.$$

Answer:

$d = 3.13\ m.$