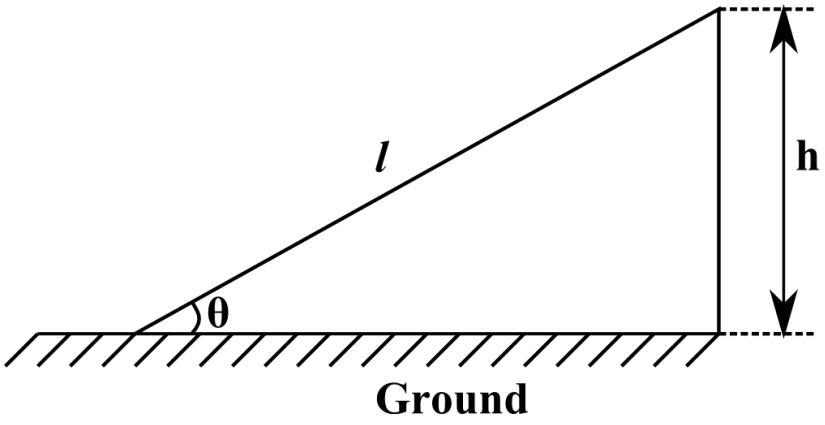
Answer on Question 59425, Physics, Mechanics, Relativity

Question:

Nancy is playing on a ladder and slide. The entry point of the slide is 3.0 m above the ground and the slide is inclined at an angle of 30.0° with the horizontal. What is Nancy's displacement each time she slides down from the top?

Solution:

Here's the sketch of our task:



The displacement is equal to the length of the slide l that Nancy travels when she slides down from the top. Then, we can find the displacement from the right triangle:

$$sin\theta = \frac{h}{l},$$

here, θ is the angle of inclination of the slide, h is the height of the slide, l is the length of the slide.

From the last formula we can calculate the Nancy's displacement:

$$Displacement = l = \frac{h}{sin\theta} = \frac{3.0\ m}{\sin 30.0^{\circ}} = \frac{3.0\ m}{0.5} = 6.0\ m.$$

Answer:

$Displacement = 6.0\ m.$