Answer on Question 49113, Physics, Mechanics | Kinematics | Dynamics

Question:

A rock thrown horizontally at 25 m/s from a cliff that is 45 m high. How far from tag base of the cliff does the rock land?

Solution:

First we find the time which rock takes to fall from the cliff on the land. Because the initial velocity of the rock along y-axis equals to zero, we can write:

$$h = \frac{1}{2}gt^2,$$

where h is the height of the cliff, t is the time and g is the acceleration of gravity. Therefore, from this formula we obtain the time:

$$t = \sqrt{\frac{2h}{g}} = \sqrt{\frac{2 \cdot 45m}{9.8\,m/s^2}} = 3.03s.$$

So, we can find how far from tag base of the cliff the rock land:

$$d = v_{rock}t = 25\frac{m}{s} \cdot 3.03s = 75.75m.$$

Answer:

The rock lands 75.75 meters far from tag base of the cliff.