

Question#19154

A transport airplane flies horizontally with a constant velocity of 600 km/h, at a height of 2 km. Directly over a marker it releases an empty fuel tank. How far ahead of the marker does the tank hit the ground? At this time, is the airplane ahead or behind the tank?

Solution:

Let:

$$v = 600 \text{ km/h} = 167 \text{ m/s}$$

$$H = 2 \text{ km} = 2000 \text{ m}$$

$S = ?$

$S = vt$, where t – is the falling time

$$H = \frac{1}{2}gt^2, t = \sqrt{\frac{2H}{g}}$$

$$S = v \sqrt{\frac{2H}{g}}$$

$$S = 167 \sqrt{\frac{2 \cdot 2000}{9.8}} = 3374 \text{ m}$$

Answer: the tank hit the ground **3374 m** ahead of the marker, at this time airplane is over the tank.