A police man spots a mugger from a distance of 200 meters. As the police man starts chasing the mugger, the mugger also starts running. Given that the speed of the mugger is 10km/h and that of the police man is 12km/h, how far would have the mugger run before he is caught?

Solution:

Express movement speed km/h in m/s. So, we get movement speed of the mugger $v_m = 10km/h = 2.78\,m/s$, movement speed of the police man $v_p = 12km/h = 3.33\,m/s$. Knowing the distance and speed we can determine the time to cover the distance for mugger and police:

$t_1 = \frac{200}{2.78} = 72\,sec$ - time to cover the distance for the mugger.

$t_2 = \frac{200}{3.33} = 60\,sec$ - time to cover the distance for the police man.

A police man will overtake the mugger for 12 seconds before, so we can determine the distance at which he overtakes him. We can find distance $S_m = t_2 \cdot v_m = 60 \cdot 2.78 \approx 167m$.

Answer: The mugger runs 167 meters before he's caught.