A ball kept on a wall is pushed horizontally with certain velocity and allowed to move under gravity. Such a motion is two-dimensional motion with ball covering displacements in both x and y directions. But both the x & y direction motions are independent of each other. Hence,
motion in x-direction can be considered as similar to straight line motion with no acceleration. Motion in y-direction can be considered as free fall under gravity. In the figure shown, ball is pushed horizontally from a height of 19.6 m, with initial velocity as 10 m/s
[Take g = 9.8 m/s2]

10. The horizontal displacement of projectile after 1 sec.

Solution:
Equation of motion of the ball along the X-axis:
$$S = V_x t + \frac{g_x t^2}{2},$$
g_x − the projection of the gravitational acceleration on the X axis
$$g_x = 0, V_x = V = 10\frac{m}{s}, \Rightarrow$$
$$S = Vt = 10\frac{m}{s} \cdot 1\,s = 10\ m$$
Answer: The horizontal displacement of projectile after 1 sec is 10m