An object is thrown horizontally from a height of 20 m with velocity 10ms-1.Find its velocity after 1s
(g=10ms-2)

**Solution:**

Resulting velocity after 1s - is the vector sum of velocities along the X-axis and Y-axis:

$$\vec{V} = \vec{V}_x + \vec{V}_y$$

Along the X axis there is no acceleration, hence:

$$V_x = V_0 = 10\frac{m}{s}$$

Along the Y axis there is acceleration $g = 9.8\frac{m}{s^2}$, so we can write rate equation for Y axis:

$$V_y = 0 + gt$$

$$V_y = gt = 10\frac{m}{s^2} \cdot 1s = 10\frac{m}{s}$$

Now we can find resulting velocity after 1 s (from the right triangle ABC) :

$$V = \sqrt{V_x^2 + V_y^2} = \sqrt{\left(10\frac{m}{s}\right)^2 + \left(10\frac{m}{s}\right)^2} = 10\sqrt{2}\frac{m}{s} = 14\frac{m}{s}$$

**Answer:** velocity after 1s will be $14\frac{m}{s}$.