Answer on Question #69690 - Physics / Other

A body of mass $m = 2$ kg is moving with a velocity of $\hat{u} = 3\hat{\imath} + 4\hat{\jmath}$ m/s. A steady force $\hat{F} = \hat{\imath} - 2\hat{\jmath}$ N begins to act on it after $t = 4$ seconds, the body will be moving along.

Solution:

The acceleration of the body

$$\hat{a} = \frac{\hat{F}}{m} = \frac{\hat{\imath} - 2\hat{\jmath}}{2} = 0.5\hat{\imath} - \hat{\jmath}.$$

Velocity of the body after 4 seconds

$$\hat{v} = \hat{u} + \hat{a}\,t = 3\hat{\imath} + 4\hat{\jmath} + 4(0.5\hat{\imath} - \hat{\jmath}) = 5\hat{\imath} + 0\hat{\jmath}.$$

Thus, the body after 4 seconds will be moving along $x-$ axes with speed 5 m/s.

Answer: Along $x-$ axes with speed 5 m/s.