Linear Momentum.

(1) Linear momentum of a body is the quantity of motion contained in the body.

(2) It is measured in terms of the force required to stop the body in unit time.

(3) It is measured as the product of the mass of the body and its velocity i.e., Momentum = mass × velocity.

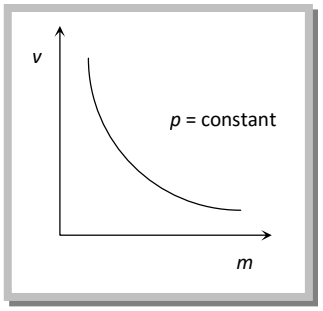
If a body of mass m is moving with velocity $\vec{v}$ then its linear momentum $\vec{p}$ is given by $\vec{p} = m\vec{v}$

(4) It is a vector quantity and its direction is the same as the direction of velocity of the body.

(5) Units: kg-m/sec [S.I.], g-cm/sec [C.G.S.]

(6) Dimension:$[MLT^{-1}]$

(7) If two objects of different masses have same momentum, the lighter body possesses greater velocity.



$$p = m_1 v_1 = m_2 v_2 = \text{constant}$$

$\therefore \frac{v_1}{v_2} = \frac{m_2}{m_1}$ i.e. $v \propto \frac{1}{m}$ [As p is constant]

(8) For a given body $p \propto v$

(9) For different bodies at same velocities $p \propto m$