

momentum we have $F_{\text{ext}} = 0$

Therefore, $\frac{dp}{dt} = 0 \Rightarrow$ momentum is constant

Also by Newton's 3rd law of motion,
we have $F_{12} = -F_{21}$

$$\Rightarrow \frac{dp_{12}}{dt} = -\frac{dp_{21}}{dt} \Rightarrow dp_{12} = -dp_{21}$$

$$\Rightarrow dp_{12} + dp_{21} = 0$$

Thus the law of conservation of momentum is proved.

- ③ A hockey player is moving northward and suddenly turns westward with the same speed to avoid an opponent. The force that acts on the player is:

- (A) Frictional force along westward.
- (B) Muscle force along southward.
- (C) friction force along ^{the} south-west.
- (D) muscle force acting south-west

Ans:- (C)

Since the frictional force always tries to resist the motion, hence the force that acts on the player moving northward and then suddenly turning westward is the frictional force acting along the South-west direction.

④