

5.6 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) frictional force along south-west.
- (d) muscle force along south-west.

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$$V_{\text{initial}} = v_0 \hat{x}$$

$$V_{\text{final}} = v_1 (-\hat{y})$$

$$\text{change in momentum} = \text{Impulse} = v_f - v_i$$

$$\Rightarrow v_1 (-\hat{y} - \hat{x})$$

$$\Rightarrow -v_1 (\hat{y} + \hat{x})$$

Change in mom. ~~change~~ (Impulse) \Rightarrow - in South-west

So, force = South west!

