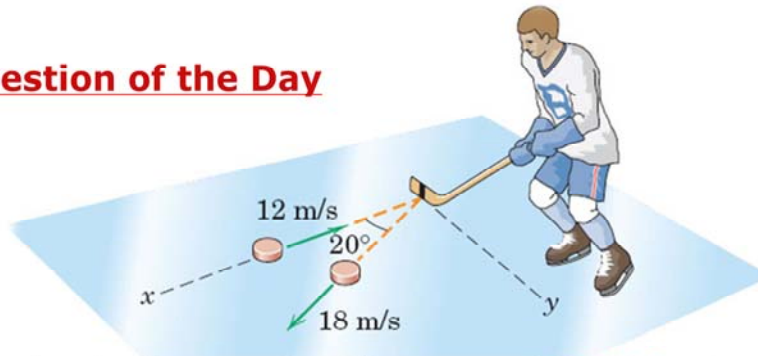


### Question of the Day



An ice-hockey puck with **mass** of **0.20 kg** has a **velocity** of **12 m/s** before being struck by the stick. After a **0.04 s impact**, the puck moves in the new direction shown with a **velocity** of **18 m/s**.

Determine the magnitude of average **force  $F$**  exerted by the stick on the puck **during contact**.

ME 231: Dynamics

$$\boxed{3/211} \quad \int \underline{F} dt = \underline{F} t = m \Delta \underline{v}$$

$$\underline{F} = \frac{0.20}{0.04} \left( [18 \cos 20^\circ] \underline{i} + [18 \sin 20^\circ] \underline{j} - [-12 \underline{i}] \right)$$

$$= 5 \left( 18 \times 0.9397 \underline{i} + 18 \times 0.3420 \underline{j} + 12 \underline{i} \right)$$

$$= 30 (4.819 \underline{i} + 1.026 \underline{j}) \text{ N}$$

$$F = 30 \sqrt{4.819^2 + 1.026^2} = \underline{147.8 \text{ N}}$$

$$\beta = \tan^{-1} v_y/v_x = \tan^{-1} \frac{1.026}{4.819} = \underline{12.02^\circ}$$