

(1156)

$$= 2 \left(8 + 30(2) \right) = \boxed{136 \text{ N} \cdot \text{f}}$$

A body of mass 10kg is acted upon by two perpendicular forces, 6N and 8N.

The resultant acceleration of the body is

- (A) 1 m/s^2 at an angle of $\tan^{-1}\left(\frac{4}{3}\right)$ w.r.t 6N force
- (B) 0.2 m/s^2 at an angle of $\tan^{-1}\left(\frac{4}{3}\right)$ w.r.t 6N force.
- (C) 1 m/s^2 at an angle of $\tan^{-1}\left(\frac{3}{4}\right)$ w.r.t 8N force
- (D) 0.2 m/s^2 at an angle of $\tan^{-1}\left(\frac{3}{4}\right)$ w.r.t 8N force.

Ans: (A), (C).

Since forces are acting perpendicular

$$\Rightarrow \text{their resultant magnitude} = \sqrt{8^2 + 6^2} = 10 \text{ N}.$$

Hence acceleration magnitude will be

$$a = \frac{F}{m} = \frac{10}{10} = 1 \text{ m/s}^2.$$

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Now, we have, $\tan \theta = \frac{3}{6} = \frac{1}{2} \Rightarrow \theta = \tan^{-1}\left(\frac{1}{2}\right)$

And, $\tan \theta_2 = \frac{6}{8} = \frac{3}{4} \Rightarrow \theta_2 = \tan^{-1}\left(\frac{3}{4}\right)$.
