

Mathematics Questions by Topics

Motion and Force

Question 4

Source: K21SM2Q15

Question 4

A particle of mass 2 kg, is moving so that its velocity vector at a time t , given by

$$\dot{\mathbf{r}}(t) = 4\sin^2(t)\mathbf{i} + 4\cos^2(t)\mathbf{j}, \text{ for } t \geq 0, \text{ given that } \mathbf{r}\left(\frac{\pi}{4}\right) = \frac{\pi}{2}(\mathbf{i} + \mathbf{j})$$

The change in momentum over $\frac{\pi}{6} \leq t \leq \frac{\pi}{4}$, is given by

- A. $-2\mathbf{i} + 2\mathbf{j}$.
- B. $2\mathbf{i} - 2\mathbf{j}$.
- C. $\mathbf{i} - \mathbf{j}$
- D. $-\mathbf{i} + \mathbf{j}$
- E. $2\sqrt{2}$