



Suppose a particle is under the influence of a force $F = i + 5j$.

Compare the work done by the force along the path $O \rightarrow A \rightarrow C$ with that along the path $O \rightarrow C$.

- A) $W_{OAC} < W_{OC}$.
- B) $W_{OAC} = W_{OC}$.
- C) $W_{OAC} > W_{OC}$.

Explanation:

For both cases, the work done is given by $W = \int_{path} \vec{F} \cdot d\vec{s}$.

For a constant force F the work in going from O to C is given by $W_{OC} = F \cdot OC \cos \alpha$ (see sketch).

On the other hand to evaluate the work from O to A and then to C , one has: $W_{OAC} = F_x \cdot OA + F_y \cdot AC$.

The dot-product identity implies $W_{OAC} = W_{OC}$.

Answer **B**.