

Assignment1

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September 2020

Question

A body constrained to move along the z-axis of a coordinate system is subject to a constant force:

$$\mathbf{F} = \begin{pmatrix} -1 \\ 2 \\ 3 \end{pmatrix}$$

What is the work done by this force in moving the body a distance of 4 m along the z-axis?

Answer

Work done in moving an object by a distance \mathbf{s} using an external force \mathbf{F} is given by:

$$W = \vec{F} \cdot \vec{s}$$

As seen above, work done is the dot product (scalar product) of Force and distance.

Here,

$$\mathbf{s} = (0 \quad 0 \quad 4)$$

The scalar product of the variables is given by:

$$\mathbf{F} \cdot \mathbf{s} = \begin{pmatrix} -1 \\ 2 \\ 3 \end{pmatrix} \cdot (0 \quad 0 \quad 4) = 12$$

The work done by the force \mathbf{F} is 12 J

Links

Download all the codes from [here](#)

Download the LaTeX files from [here](#)