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:

$$W =$$

$\mathbf{F}^T s$

$As\ seen\ above, work\ done\ is\ the\ dot\ product\ (scalar\ product)\ of\ Force\ and\ distance. Here, \mathbf{s} = \begin{pmatrix} 0 \\ 0 \\ 4 \end{pmatrix} The\ scalar\ produc$

$$\mathbf{F.s} = \begin{pmatrix} -1 & 2 & 3 \end{pmatrix} \begin{pmatrix} 0 \\ 0 \\ 4 \end{pmatrix} = 12$$

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

Links

Download all the codes from here
Download the LaTeX files from here