Assignment1

Anjana V

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 **s** using an external force **F** is given by:

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

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 product of the variables is given by:

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

The work done by the force **F** is 12 J

Links

Download all the codes and related files from the Github repository