Answer on Question #41164, Physics, Mechanics | Kinematics | Dynamics

Question:

The gravitation field in a region is given by g=2i+3j m/s2. The work done in moving a particle of mass=1Kg from (1,1) to (2,1/3) along line 3y+2x=s is

a)zero

b)20J

c)-15J

d)18J

Answer:

Work can be expressed by the following equation:

$$W = \vec{F}\vec{d}$$

where $\vec{F}$ is the force, $\vec{d}$ is the displacement.

Force equals:

$$\vec{F} = m\vec{a} = (2\vec{i} + 3\vec{j})\ N$$

Vector of displacement equals:

$$\vec{d} = (2-1)\vec{i} + \left(\frac{1}{3} - 1\right)\vec{j} = \vec{i} - \frac{2}{3}\vec{j}$$

Work equals:

$$(2\vec{i} + 3\vec{j})\left(\vec{i} - \frac{2}{3}\vec{j}\right) = 2 + 3\left(-\frac{2}{3}\right) = 0$$

Answer: a)zero

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