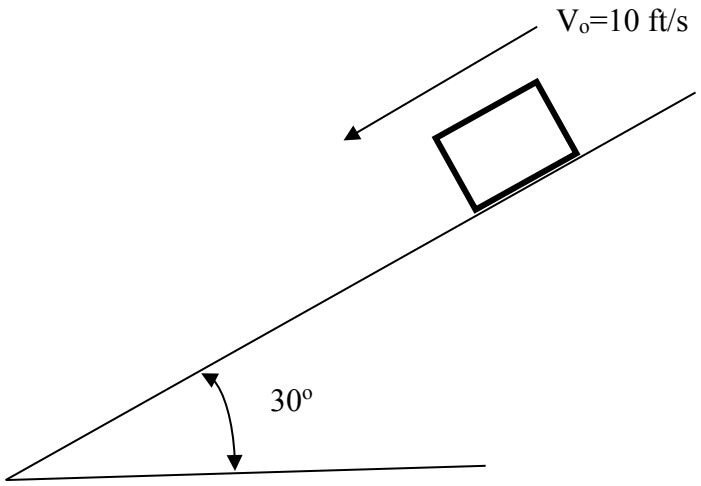
TOPIC

Engineering Mechanics (Statics and Dynamics) – Section VII – Question 17

QUESTION

A 161 lb block travels down a 30° inclined plane with initial velocity of 10 ft/s. If the coefficient of friction is 0.2, the total work done, in ft-lbs by all forces when the block moves through a distance of 5 ft most nearly is

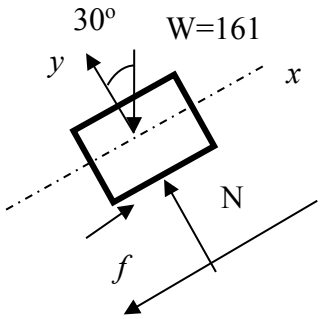


(A) −239.4
(B) 80.50
(C) 263.1
(D) 402.5

HINT

- Work is force times distance.
- Forces that are perpendicular to displacement do not work.
- Forces in the same direction as the displacement produce positive work and vice-versa.

SOLUTION



Displacement

WORK

$U_{12} = 161\ sin\ 3\ 0°(5) - \mu Nd$

$= (161)(sin(30°))(5) - (0.2)(161\ cos(30°))(5)$

$= 263.1$ft-lbs

ANSWER

(C)

CONTRIBUTOR

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