20-P-MOM-PT-001

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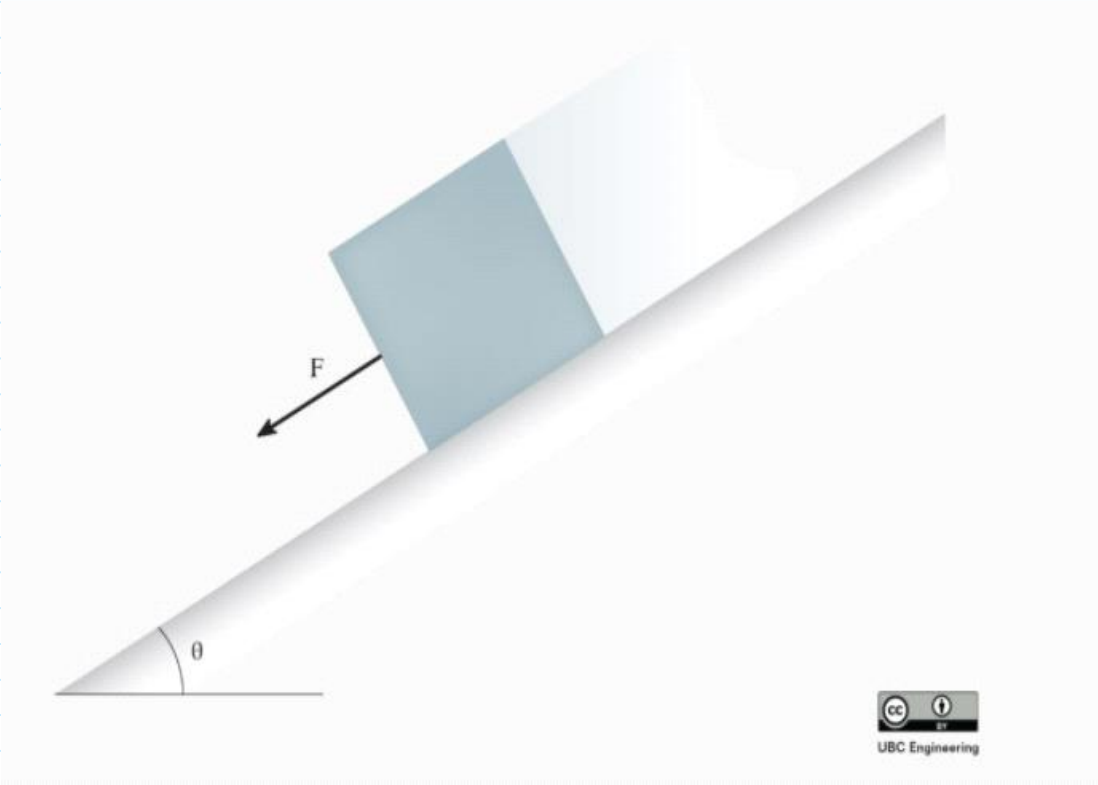
A force F= 5N acts on an unmoving box with a mass of m=3 kg for t=3.5 s. What is the kinetic energy of the box? Assume that there is no other force acting on the box.



Solution:

$m v_1 + \Sigma \int F\,dt = m v_2$ $\quad v_1 = 0$

$F = 5N$

$m = 3kg$

$t = 3.5s$

$F \cdot t = m \cdot v_2$

$v_2 = \frac{F \cdot t}{m} = \frac{5 \cdot 3.5}{3} = 5.83 m/s$

$E_k = \frac{1}{2} m v_2^2 = \frac{1}{2} 3 \cdot (5.83)^2$

$= 51.04 J$

The kinetic energy of the box is 51.04J