

FRQ - 5 Answers

NOTE: The friction force causes an increase in thermal energy of the amount $E_{th} = f_k \Delta s$. We cannot calculate work done by the friction force using $W = \vec{F} \cdot \vec{d}$ because it is impossible to know $\vec{d}$ due to roughness of surfaces.

• Chart:

Segment	object	motion	observations	principles
Block C is pushed by spring	particles	Linear	friction, spring force varies	energy
Block C and Block D collide & stick	particles	Linear	if they don't slide during collision, $J_x = 0$	momentum
The two blocks slide to a stop	particles	Linear	friction on both blocks, force is constant	Newton's Laws kinematics energy

a. 50 J

b. 4.59 m/s

c. 3.1 m/s

d. 1.2 m

→ if you used N2L first, the acceleration was $a = -3.92 \text{ m/s}^2$