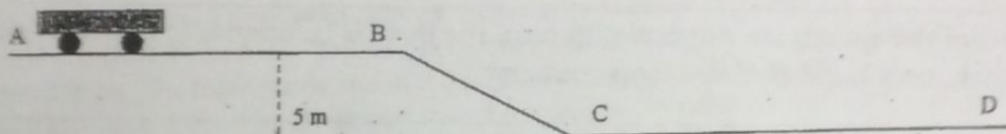


Energy: Work and heat

Your values: $v_0 =$ _____ m/s $F_{push} =$ _____ N $\mu =$ _____



1. A 50 kg cart is coasting along the upper surface as shown on the diagram at point A with an initial speed of v_0 m/sec. While the cart is on the upper surface, the cart is given an extra forward push (in the direction of motion) of F_{push} over a distance of 1.5 meter.

Question: What is the speed of the cart at point B after being pushed?

$$K_0 + U_{p0} + \text{Work} = K_f + U_{gf} + \text{Heat}$$

2. The cart then rolls down a ramp with a vertical altitude of 5 m on to a lower surface.
Question: What is the speed of the cart on the lower surface (point C)? Ignore friction.

$$K_0 + U_{p0} + \text{Work} = K_f + U_{gf} + \text{Heat}$$

3. There is a force of friction on the bottom surface only with a coefficient of friction μ .
Question: How far will the cart roll along the bottom surface before coming to a stop (point D)?

$$K_0 + U_{p0} + U_{chem0} + \text{Work} = K_f + U_{gf} + U_{chemf} + U_{int}$$
