

Quiz #7: Work and Kinetic Energy

Problem 1 (1.5 points)

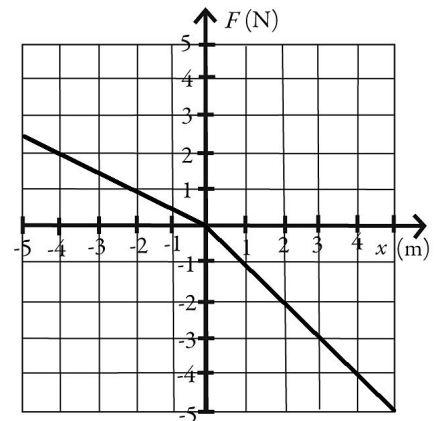
A spring stretches by 21.0 cm when a 135 N force is applied. How much force would be required to stretch the spring by 31.0 cm?

- a) 199 N
- b) 91.0 N
- c) 145 N
- d) 279 N
- e) none of the above

Problem 2 (1.5 points)

A graph of the force on an object as a function of its position is shown in the figure. Determine the amount of work done by this force on the object during a displacement from $x = -2.00$ m to $x = 2.00$ m. (Assume an accuracy of 3 significant figures for the numbers on the graph.)

- a) -12.0 J
- b) -3.00 J
- c) -1.00 J
- d) 12.0 J
- e) 3.00 J



Problem 3 (2 points)

Two position vectors are given by $\vec{A} = (6.0 \text{ m})\hat{i} + (4.0 \text{ m})\hat{j} - (2.0 \text{ m})\hat{k}$ and $\vec{B} = (5.0 \text{ m})\hat{i} - (6.0 \text{ m})\hat{j} - (3.0 \text{ m})\hat{k}$. What is the scalar product of $\vec{A} \cdot \vec{B}$?

Problem 4 (5 points)

In the figure below, two constant forces, $P = 160\text{ N}$ and $F = 78.2\text{ N}$, are applied to a 20.0-kg box which is on a frictionless horizontal surface. Assuming that the cart starts from rest, use work and energy to calculate its speed after traveling 8.0 m .

