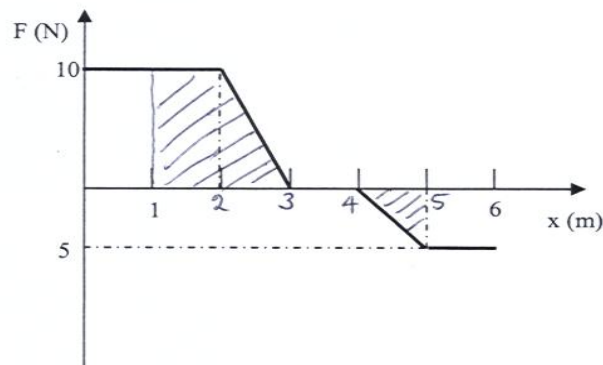


Physics 101-Rec
Quiz # 6

Instructor: Dr. Mekki

Name: Key Id#: _____ Sect.#: _____

A 2.0 kg object moving along the x- axis has a velocity of 5 m/s at $x = 1.0$ m. If the only force acting on this object is shown in the figure, what is the speed of the object at $x = 5.0$ m?



$$x_i = 1 \text{ m} \rightarrow x_f = 5 \text{ m}$$

$$v_i = 5 \text{ m/s} \Rightarrow K_i = \frac{1}{2} m v_i^2 = \frac{1}{2} \times 2 \times (5)^2 = 25 \text{ J}$$

$$W = \Delta K = K_f - K_i = \text{area under the curve.}$$

$$W = 1 \times 10 + \frac{1}{2} \times 1 \times 10 - \frac{1}{2} \times 1 \times 5$$

$$= 15 - 2.5 = 12.5 \text{ J}$$

$$\Rightarrow K_f = W + K_i = 12.5 + 25 = 37.5 \text{ J}$$

$$= \frac{1}{2} m v_f^2 = \frac{1}{2} \times 2 \times v_f^2$$

$$\Rightarrow v_f = \sqrt{37.5} = \boxed{6.1 \text{ m/s}}$$