

PP 1245
 24. $m = 0.500 \text{ kg}$
 $v_i = 0$
 $v_f = 1.2 \text{ m/s}$
 $\Delta d = 0.1 \text{ m}$

a) $E_{k2} = ?$
 b) $F = ?$

a) $E_k = \frac{1}{2}mv^2$
 $E_{k2} = \frac{1}{2}(0.500 \text{ kg})(1.2 \text{ m/s})^2$
 $E_{k2} = 0.36 \text{ J}$

b) $W = \Delta E_k$
 $W = E_{k2} - E_{k1}$
 $F_{net} \Delta d = E_{k2} - E_{k1}$
 $F_{net} = \frac{E_{k2} - E_{k1}}{\Delta d}$
 $F_{net} = \frac{0.36 \text{ J}}{0.1 \text{ m}}$
 $F_{net} = 3.6 \text{ N}$ **Not yet**

$W = \Delta E_k$
 $E_2 - E_1$

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6.3 Potential Energy + the Work-Energy Theorem

Gravitational Potential

- Stored energy due to its position above a certain reference level.

$E_g = mgh$
 Where E_g is the gravitational potential energy (J)
 m is the mass (kg)
 g is 9.8 m/s^2
 h is the height above the reference level (m)

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$m = 300 \text{ g}$
 $h = 0.68 \text{ m}$
 $E_g = mgh = (0.3 \text{ kg})(9.8 \text{ m/s}^2)(0.68 \text{ m})$
 $E_g = 2.01 \text{ J}$
 with respect to the horizontal ground

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Consider lifting a mass from h_1 to h_2 .

$W_{total} = W_{net} = W_{grav} + W_{ext}$
 $W_{total} = W_{grav} + W_{ext}$
 $W_{total} = mgh_2 - mgh_1$
 $W_{total} = mgh_2 - mgh_1$
 $W_{total} = mgh_2 - mgh_1$
 $W_{total} = mgh_2 - mgh_1$

Work-Energy Theorem:
 $W_{net} = \Delta E_k$

Work:
 $W = Fd$
 $W = mgh$

The distance traveled is 25.0 m
 $\Delta h = 25.0 \text{ m}$

$W = Fd$
 $W = mgh$
 $W = mgh$
 $W = mgh$

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 ① PP 1250
 ② PP 1249

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