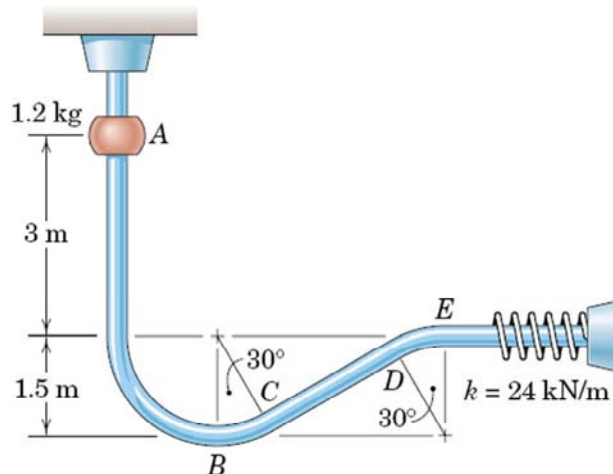


**Work-Energy:
Exercise 1**



The **1.2-kg** slider is released from rest at **A** and slides without friction along the guide.

Determine (a) the **speed v_B** of the slider at **B** and (b) the **maximum deflection δ** of the spring.

ME 231: Dynamics

3/149 Establish datum @ A.

$$(a) \quad T_A + V_A = T_B + V_B$$

$$0 + 0 = \frac{1}{2}mv_B^2 - mgh_B$$

$$v_B = \sqrt{2gh_B} = \sqrt{2(9.81)(4.5)} = \underline{9.40 \text{ m/s}}$$

(b) State F : spring fully compressed

$$T_A + V_A = T_F + V_F$$

$$0 + 0 = 0 - mgh_f + \frac{1}{2}k\delta^2$$

$$\delta = \sqrt{\frac{2mgh_f}{k}} = \sqrt{\frac{2(1.2)(9.81)(3)}{24000}} = 0.0542 \text{ m}$$

or $\underline{\delta = 54.2 \text{ mm}}$