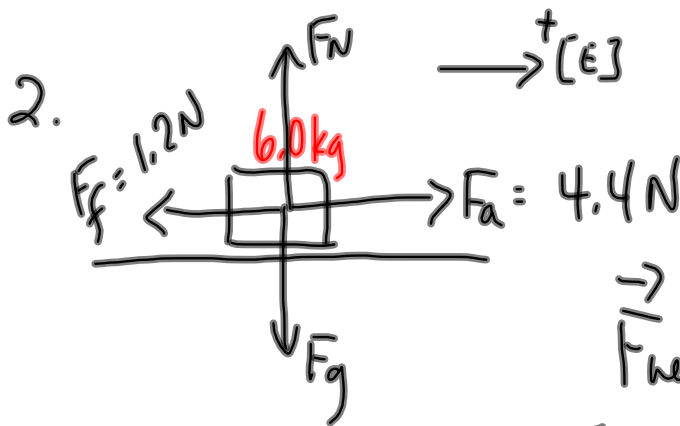


## Newton's Second Law:

- ① Draw a FBD
- ② Set up  $\vec{F}_{\text{net}} = m\vec{a}$

PP/163



$$\vec{F}_{\text{net}} = m\vec{a}$$

$$F_a - F_f = ma$$

$$4.4\text{N} - 1.2\text{N} = (6.0\text{kg})a$$

$$3.2\text{N} = (6.0\text{kg})a$$

$$a = +0.53\text{ m/s}^2$$

$$\vec{a} = 0.53\text{ m/s}^2 [\text{E}]$$

MP/165

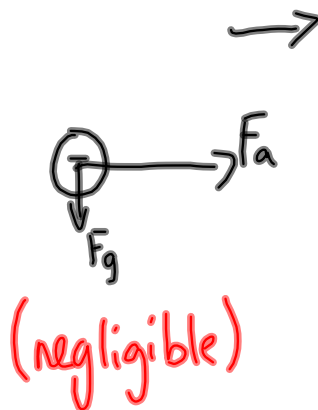
$$m = 9.1 \times 10^{-31} \text{ kg}$$

$$v_1 = 0$$

$$\Delta d = 3.5 \text{ mm} = 3.5 \times 10^{-3} \text{ m}$$

$$F_a = 5.8 \times 10^{-15} \text{ N}$$

$$v_2 = ?$$



Find the acceleration:

$$\vec{F}_{\text{net}} = m \vec{a}$$

$$F_a = ma$$

$$a = \frac{F_a}{m}$$

$$a = \frac{5.8 \times 10^{-15} \text{ N}}{9.1 \times 10^{-31} \text{ kg}}$$

$$a = 6.3736 \times 10^{15} \text{ m/s}^2$$

Find  $v_2$ :

$$v_2^2 = v_1^2 + 2a\Delta d$$

$$v_2^2 = 0^2 + 2(6.3736 \times 10^{15} \text{ m/s}^2)(3.5 \times 10^{-3})$$

$$v_2 = 6.7 \times 10^6 \text{ m/s}$$

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$$\vec{F}_a = 9.50 \text{ N} [\text{s}]$$

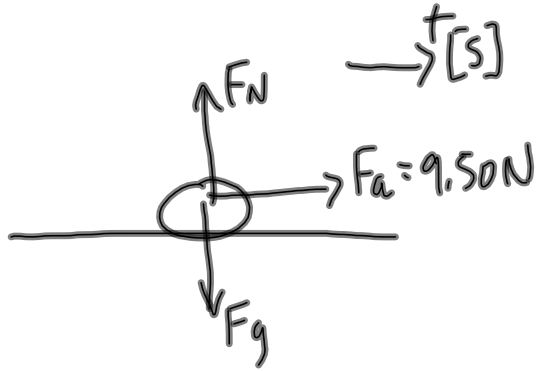
$$m = 20.0 \text{ kg}$$

$$\Delta t = 1.86 \text{ s}$$

$$v_1 = 0$$

$$\text{a) } a_{\text{ave}} = ?$$

$$\text{b) } v_2 = ?$$



Find the acceleration:

$$\vec{F}_{\text{net}} = m\vec{a}$$

$$F_a = ma$$

$$a = \frac{F_a}{m}$$

$$a = \frac{9.50 \text{ N}}{20.0 \text{ kg}}$$

$$a = +0.475 \text{ m/s}^2$$

$$\vec{a} = 0.475 \text{ m/s}^2 [\text{s}]$$

find  $v_2$ :

$$\vec{a} = \frac{\Delta \vec{v}}{\Delta t}$$

$$\vec{a} = \frac{\vec{v}_2 - \vec{v}_1}{\Delta t}$$

$$\vec{a} \Delta t = \vec{v}_2 - \vec{v}_1$$

$$\vec{v}_2 = \vec{v}_1 + \vec{a} \Delta t$$

$$\vec{v}_2 = 0 + (0.475 \text{ m/s}^2 [\text{s}]) (1.86 \text{ s})$$

$$\vec{v}_2 = 0.884 \text{ m/s} [\text{s}]$$

TO DO: ① PP|168

② Assignment (Nov 1)