

Actividad 2. Leyes de Newton.

1- $f = ?$
 $m = 40 \text{ kg}$
 $v_i = 0 \text{ m/s}$
 $v_f = 3 \text{ m/s}$
 $t = 1 \text{ segundo}$

$$a = \frac{v_f - v_i}{t}$$
$$a = \frac{3 \text{ m/s} - 0}{1 \text{ segundo}}$$
$$f = m \times a$$
$$f = 40 \text{ kg} \times 3 \text{ m/s}^2$$
$$f = \underline{\underline{120 \text{ N}}}$$

2- $m = ? \text{ kg}$
 $f = 300 \text{ N}$
 $a = 150 \text{ cm/s}^2 = 1.5 \text{ m/s}^2$

$$m = f/a$$
$$m = \frac{300 \text{ kg m/s}^2}{1.5 \text{ m/s}^2}$$
$$m = \underline{\underline{200 \text{ kg}}}$$

3- $a = ? \text{ m/s}^2$
 $f = 75 \text{ N}$
 $m = 1500 \text{ g} = 1.5 \text{ kg}$

$$a = f/m$$
$$a = \frac{75 \text{ kg m/s}^2}{1.5 \text{ kg}}$$
$$a = \underline{\underline{50 \text{ m/s}^2}}$$

4- $f = ?$
 $m = 10 \text{ kg}$
 $a = 2.5 \text{ m/s}^2$

$$f = m \times a$$
$$f = 10 \text{ kg} \times 2.5 \text{ m/s}^2$$
$$f = \underline{\underline{25 \text{ N}}}$$

5- $P = ?$
 $m = 100 \text{ kg}$
 $g = 9.8 \text{ m/s}^2$

$$P = m \times g$$
$$P = 100 \text{ kg} \times 9.8 \text{ m/s}^2$$
$$P = \underline{\underline{980 \text{ N}}}$$

6- $m = ?$
 $p = 1500 \text{ N}$
 $g = 9.8 \text{ m/s}^2$

$$m = P/g$$
$$m = \frac{1500 \text{ kg m/s}^2}{9.8 \text{ m/s}^2}$$
$$m = \underline{\underline{153.06 \text{ kg}}}$$

$$7- f = ?$$

$$p = 25 \text{ N}$$

$$a = 3 \text{ m/s}^2$$

$$g = 9.8 \text{ m/s}^2$$

$$m = P/g$$

$$m = 2.55 \text{ kg}$$

$$f = 2.55 \text{ kg} \times 3 \text{ m/s}^2$$

$$m = \frac{25 \text{ kg} \cdot \text{m/s}^2}{9.8 \text{ m/s}^2}$$

$$f = m \times a$$

$$f = 7.65 \text{ N}$$

$$8- a = ? \quad \begin{array}{|c|} \hline 30 \text{ N} \rightarrow \\ \hline \end{array} \quad \begin{array}{|c|} \hline m = 3 \text{ kg} \\ \hline \end{array} \quad \begin{array}{|c|} \hline \leftarrow 40 \text{ N} \\ \hline \end{array}$$

$$30 + 50 - 40 = 40 \text{ N}$$

$$a = f/m$$

$$a = \frac{40 \text{ kg} \cdot \text{m/s}^2}{3 \text{ kg}}$$

$$a = 13.33 \text{ m/s}^2$$

$$9- m = 8 \text{ kg} \quad v_x = 4 \text{ m/s}$$

$$R = ?$$

$$F_x = ?$$

$$t = 1.5 \text{ seg}$$

$$g = 9.8 \text{ m/s}^2$$

$$\therefore P = mg$$

$$\therefore F_x = m a_x$$

$$\therefore F_y = m a_y$$

- Para calcular la magnitud de la fuerza de reacción que el piso ejerce sobre el bloque, con la segunda ley de Newton determinamos la suma de las fuerzas en el eje vertical:

$$\sum F_y = R + (-P) = m a_y$$

$$\text{No hay movimiento vertical: } \therefore \sum F_y = R - P = 0 \therefore R = P$$

$$P = mg = 8 \text{ kg} \times 9.8 \text{ m/s}^2 = 78.4 \text{ N} = R$$

$$- F_x = m a_x$$

$$a_x = \frac{v_x - v_0}{t} = \frac{4 \text{ m/s} - 0}{1.5 \text{ s}} = 2.66 \text{ m/s}^2$$

$$F_x = 8 \text{ kg} \times 2.66 \text{ m/s}^2 = 21.28 \text{ N}$$