

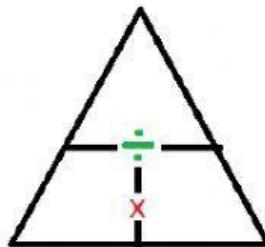
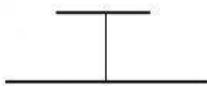
NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

## Momentum

Momentum can be calculated using this equation: Momentum = ..... x .....

The units of momentum are kgm/s.

Complete the transposition triangle below using the letters **m**, **v**, **p**.

1. Calculate the momentum of

a) An athlete of mass 60 kg running at a velocity of 10 m/s.

$$\text{Momentum} = \text{Mass} \times \text{Velocity}$$

$$= \underline{\hspace{2cm}} \text{kg} \times \underline{\hspace{2cm}} \text{m/s}$$

$$= \underline{\hspace{2cm}} \text{kgm/s}$$

b) A ship of mass 200,000 kg traveling at a velocity of 5 m/s.

$$\text{Momentum} = \text{Mass} \times \text{Velocity}$$

$$= \underline{\hspace{2cm}} \text{kg} \times \underline{\hspace{2cm}} \text{m/s}$$

$$= \underline{\hspace{2cm}} \text{kgm/s}$$

c) A rocket of mass 650 000 kg traveling at a velocity of 2 km/s.

$$\text{Momentum} = \text{Mass} \times \text{Velocity}$$

$$= \underline{\hspace{2cm}} \text{kg} \times \underline{\hspace{2cm}} \text{m/s}$$

$$= \underline{\hspace{2cm}} \text{kgm/s}$$

d) A mouse of mass 500g scuttling through the grass at 3m/s.

$$\text{Momentum} = \text{Mass} \times \text{Velocity}$$

$$= \underline{\hspace{2cm}} \text{g} \times \underline{\hspace{2cm}} \text{m/s}$$

$$= \underline{\hspace{2cm}} \text{gm/s}$$

2. An athlete running at 8m/s has a momentum of 520kgm/s. What is her mass?

$$\text{Mass} = \text{Momentum} / \text{Velocity}$$

$$= \underline{\hspace{2cm}} \text{kgm/s} / \underline{\hspace{2cm}} \text{m/s}$$

$$= \underline{\hspace{2cm}} \text{kg}$$

3. A model airplane traveling through the sky has a mass of 12kg and a momentum of 360kgm/s.

Calculate the velocity of the plane.

$$\text{Velocity} = \text{Momentum} / \text{Mass}$$

$$= \underline{\hspace{2cm}} \text{kgm/s} / \underline{\hspace{2cm}} \text{kg}$$

$$= \underline{\hspace{2cm}} \text{m/s}$$

4. Calculate the momentums of the cars below.

Car A

mass = 300kg  
velocity = 10m/s



travelling right

Car B

mass = 500 kg  
velocity = 30m/s



travelling left

Car A Momentum = Mass x Velocity  = <u>          </u> kg x <u>          </u> m/s  = <u>          </u> kgm/s	Car B Momentum = Mass x Velocity  = <u>          </u> kg x <u>          </u> m/s  = <u>          </u> kgm/s
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a. The two cars collide and stick together. What type of collision is this? \_\_\_\_\_

b. Stuck together, in which direction will the two cars travel, after they collide? \_\_\_\_\_