

Name _____
Honors Physics
Period _____

Date _____
Momentum WS #1
Mrs. Nadworny

Momentum

Directions: Read online textbook pages 207 – 214. Solve the following problems using the GUESS method and proper significant figures. Be sure to show ALL work.

1. The magnitude of the momentum of an object is 64.0 kilogram-meter per second. If the velocity of the object is doubled, the magnitude of the momentum will be

A) $32.0 \frac{\text{kg}\cdot\text{m}}{\text{s}}$ B) $64.0 \frac{\text{kg}\cdot\text{m}}{\text{s}}$ C) **$128 \frac{\text{kg}\cdot\text{m}}{\text{s}}$** D) $256 \frac{\text{kg}\cdot\text{m}}{\text{s}}$

2. A 0.0600 kilogram ball traveling at 60.0 meters per second hits a concrete wall. What speed must a 0.0100 kilogram bullet have in order to hit the wall with the same magnitude of momentum as the ball?

A) 3.60 m/s B) 6.00 m/s C) **360. m/s** D) 600. m/s

3. At the same time, 8 kilograms of feathers and 6 kilograms of lead are dropped from a height of three meters.

a. After they have fallen 1 meter, the 6 kilograms of lead has

A) **Less mass and less inertia**
B) Less mass and the same inertia
C) More mass and less inertia
D) More mass and the same inertia

b. After they have fallen 1 meter, the 6 kilograms of lead has

A) Less speed and less momentum
B) Less speed and the same momentum
C) **The same speed and less momentum**
D) The same speed and the same momentum

4. A 6.2 kg duck is flying around the pond. It has a momentum of 30.7 kg·m/s. What is the duck's speed?

$$v = \frac{p}{m} = \frac{30.7 \frac{\text{kg}\cdot\text{m}}{\text{s}}}{6.2\text{kg}} = 5.0 \frac{\text{m}}{\text{s}}$$

5. A 5.00 kilogram block slides along a horizontal, frictionless surface at 10.0 meters per second for 4.00 seconds. Calculate the magnitude of the block's momentum.

$$p = mv = (5.00\text{kg})(10.0 \frac{\text{m}}{\text{s}}) = 50.0 \frac{\text{kg}\cdot\text{m}}{\text{s}}$$

6. A mass is traveling east with a constant velocity of 40. meters per second and a momentum of 1.0×10^3 kilogram-meters per second. Calculate the size of the mass.

$$m = \frac{p}{v} = \frac{1.0 \times 10^3 \frac{\text{kg}\cdot\text{m}}{\text{s}}}{40. \frac{\text{m}}{\text{s}}} = 25\text{kg}$$

Answers in size order: 5.0, 25, 50.0