

Impulse and Momentum Practice

➤ Show work to justify your answers.

1.

A 5.0 kg ice block is sliding along a smooth floor at 1.0 m/s west when a 0.20 N force directed east acts on it for 4.0 s. What is the magnitude of the block's final momentum?

- A. 0.80 kg m/s
- B. 4.2 kg m/s
- C. 5.0 kg m/s
- D. 5.8 kg m/s

2.

A 1.0 kg physics puck is at rest when a small explosion breaks it into three pieces. A 0.50 kg piece goes north at 10 m/s and a 0.30 kg piece goes east at 20 m/s. What is the magnitude of the momentum of the third piece?

- A. 1.0 kg m/s
- B. 3.3 kg m/s
- C. 7.8 kg m/s
- D. 11 kg m/s

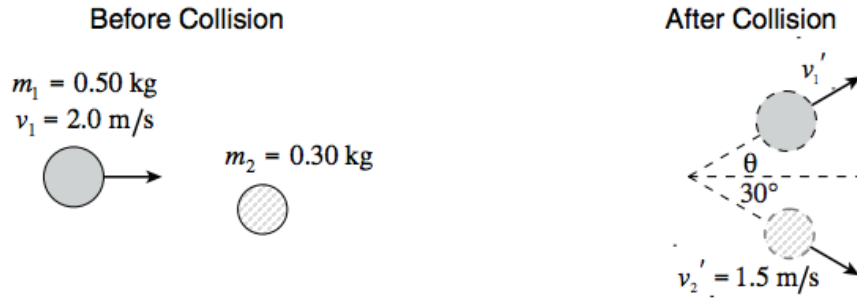
3.

A 0.25 kg ball moving north at 7.7 m/s strikes a wall obliquely and rebounds heading east with the same speed of 7.7 m/s. What was the magnitude and direction of the impulse on the ball?

	MAGNITUDE OF THE IMPULSE	DIRECTION OF THE IMPULSE
A.	1.9 N · s	Due East
B.	1.9 N · s	45°S of E
C.	2.7 N · s	Due East
D.	2.7 N · s	45°S of E

4.

A 0.50 kg puck moving at 2.0 m/s collides obliquely with a stationary 0.30 kg puck. After the collision the 0.30 kg puck moves as shown.



What is the speed of the 0.50 kg puck after the collision?

- A. 1.0 m/s
- B. 1.3 m/s
- C. 1.8 m/s
- D. 2.2 m/s

5.

Three horizontal forces are acting at the same point on a puck lying on a level frictionless table. The puck is in translational equilibrium.

Two of these forces are:

$$F_1 = 10.2 \text{ N, east}$$

$$F_2 = 15.4 \text{ N, } 30^\circ \text{ E of N}$$

What is the magnitude of the third force?

- A. 5.2 N
- B. 15.6 N
- C. 18.5 N
- D. 22.3 N

6.

A 1.5 kg ball was moving east at 72 m/s and collided with a stationary 8.3 kg wooden sphere. The ball rebounded at 43 m/s in the direction 55° north of west. What were the speed and direction of the wooden sphere after the collision?

