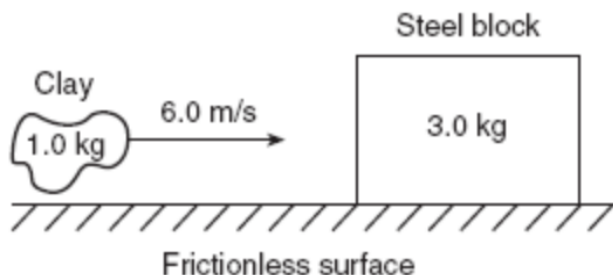


Quantitative Problems
(Given, Find, Solution REQUIRED)

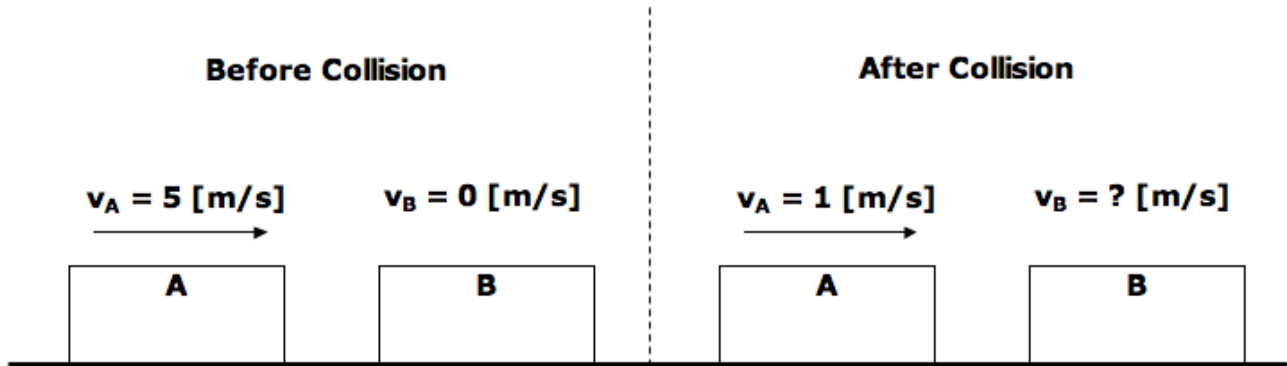
- A golf ball of mass 0.045 [kg] is hit off the tee at a speed of 42 [m/s]. The golf club was in contact with the ball for 5.3×10^{-3} [s].

 - Find the magnitude of the impulse imparted to the golf ball.
 - Find the magnitude of the average force exerted on the ball by the golf club.
- In tae-kwon-do, a hand is slammed down onto a block of wood at a speed of 15 [m/s] and comes to a stop during the 0.004 [s] collision. Assume that during the impact the hand is independent of the arm and has a mass of 0.70 [kg].

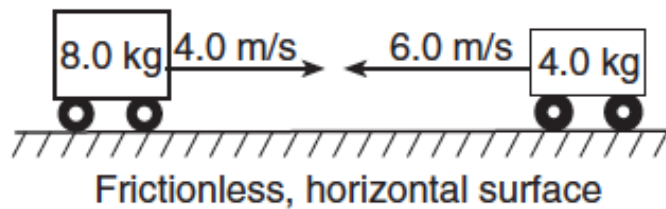
 - What is the magnitude of the impulse on the hand from the target?
 - What is the magnitude of the average force on the hand from the target?
- Rocket compartment A of mass 5201 [kg] and Rocket compartment B of mass 3449 [kg] are initially joined together and are at rest. A small planned explosion pushes the two compartments apart. Rocket compartment A moves off at -40 [m/s]. What is the velocity of Rocket compartment B after the explosion?
- Ball A of mass 8 kg moving at 7 [m/s] collides elastically with ball B of mass 4 [kg] that is initially at rest. After the collision, ball A moves off at 4 [m/s]. What is the velocity of ball B after the collision?
- A 3 [kg] steel block is at rest on a frictionless horizontal surface. A 1 [kg] lump of clay is propelled horizontally at 6.0 [m/s] toward the block as shown in the diagram below. Upon collision, the clay and steel block stick together and move to the right with a speed of which of the following?



6. Block A is moving at 5 [m/s] to the right and collides elastically with block B which initially at rest as shown below. The velocity of block A after the collision is 1 [m/s] to the right. The mass of block A is 7 [kg] and the mass of block B is 2 [kg]. What is the velocity of block B after the collision?



7. Car A of mass 8 [kg] is moving at 4 [m/s] collides elastically with car B of mass 4 [kg] as shown below. Car A bounces backward (to the left) with a velocity of 2 [m/s]. What is the velocity of car B after the collision?



HW Set 8 Answers

- 1a. 1.89 [N s]
- 1b. 357 [N]

- 2a. 10.5 [Ns]
- 2b. 2630 [N]

- 3. 60.32 [m/s]

- 4. 6 [m/s]

- 5. 1.5 [m/s]

- 6. 14 [m/s]

- 7. 6 [m/s]