

Problems
Momentum

Physics

Mr. Kanuga

1. Determine the momentum of a 5 kg block moving due west with a speed of 25 m/s . What is the kinetic energy of this block?

2. Determine the mass of a an object if it has a momentum of 100 kg m/s and a kinetic energy of 50 J .

3. A ball of mass 0.2 kg is dropped from a height of 1.2 m and is observed to reach a height of 0.8 m after it bounces off the floor.
 - (a) Determine the velocity with which the block strikes the floor.

 - (b) Determine the velocity with which the block takes off the floor.

 - (c) Determine the impulse delivered by the floor to the ball.

 - (d) The time of contact between the ball and the floor is observed to be 0.05 s . Determine the average force exerted on the ball by the floor.

4. A vehicle of mass 2000 kg moving with a speed of 15 m/s accelerates uniformly to 25 m/s due to a force of 10000 N . Determine the time it takes the vehicle to accelerate. Determine the distance traveled by the vehicle.
5. A 0.42 kg soccer ball moving due south with a speed of 18 m/s is kicked by a kicker in the opposite direction and has a speed of 15 m/s right after the kick is delivered.
- (a) Determine the impulse delivered to the ball by the kicker.
- (b) The kicker exerts an average force of 500 N on the ball. Determine the time of contact between the foot and the ball.
6. A ball moving to the right with a speed of 12 m/s is hit by a bat. The average force exerted by the bat is 800 N due left and it is observed that the bat is in contact with the ball for 0.02 s . Determine the velocity of the ball right after it is hit by the bat.