**1.**

The data in the table below were recorded during an experiment in which two carts on a frictionless one-dimensional track collide head-on. What are the values of the magnitude of the change in momentum Δp_2 of cart 2 and the magnitude of its average acceleration a_2 during the collision?

	Cart 1	Cart 2
Mass	5 kg	1 kg
Average Force	15 N	15 N
Change in Momentum	0.3 kg•m/s	Δp_2
Average Acceleration	3 m/s^2	a_2

2

A 1.0 kg lump of clay is sliding to the right on a frictionless surface with speed 2 m/s . It collides head-on and sticks to a 0.5 kg metal sphere that is sliding to the left with speed 4 m/s . What is the kinetic energy of the combined objects after the collision?

3
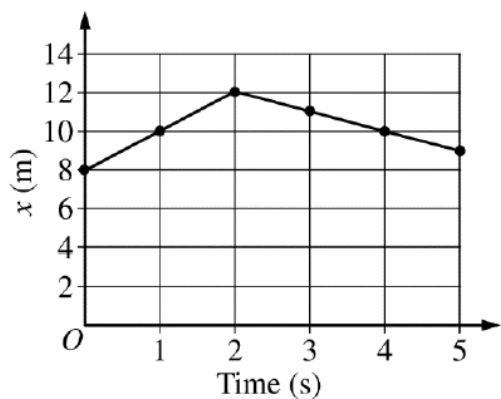
The graph above shows the position x as a function of time for the center of mass of a system of particles of total mass 6.0 kg. For a very short time interval around 2.0 s, an external force is exerted on an object in the system. What is the resulting change in momentum of the system?

4

Using a force probe, a student generates the graph above of the force exerted on a small wagon as a function of time. The wagon starts from rest and rolls with negligible friction in the axles. Which of the following graphs best represents the wagon's momentum as a function of time?
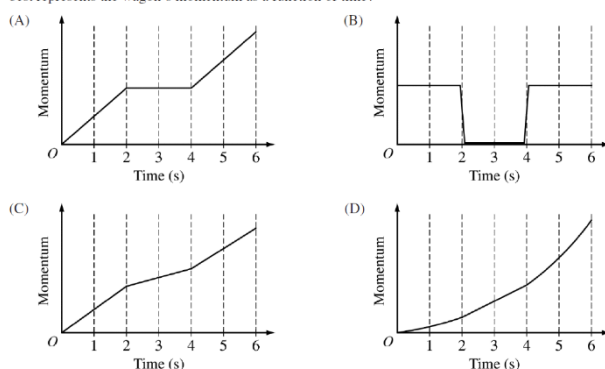
5
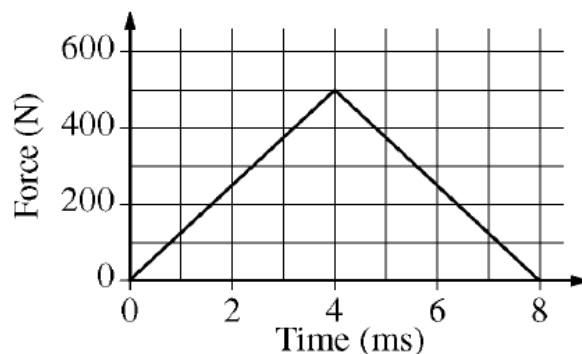
. A 0.050 kg tennis ball is moving to the left at 10 m/s when it is hit by a tennis racket that is moving to the right. The magnitude of the force exerted on the ball by the racket as a function of time is shown in the figure above. What is the speed of the ball after the collision with the racket?