1. . An athlete of mass 70.0 kg applies a force of 500 N to a 30.0 kg luge, which is initially at rest, over a period of 5.00 s before jumping onto the luge. Assuming there is no friction between the luge and the track on which it runs, what is its velocity after the athlete jumps on? (A) 12.5 m/s (B) 25.0 m/s (C) 35.7 m/s (D) 83.3 m/s (E) 100 m/s

2. . The graph shows the amount of force applied to an initially stationary 20 kg curling rock over time. What is the velocity of the rock after the force has been applied to it?  (A) 1.25 m/s (B) 5 m/s (C) 10 m/s (D) 25 m/s (E) 50 m/s

3. . A 60 kg man holding a 20 kg box rides on a skateboard at a speed of 7 m/s. He throws the box behind him, giving it a velocity of 5 m/s. with respect to the ground. What is his velocity after throwing the object?  (A) 8 m/s (B) 9 m/s (C) 10 m/s (D) 11 m/s (E) 12 m/s

4. . A scattering experiment is done with a 32 kg disc and two 8 kg discs on a frictionless surface. In the initial state of the experiment, the heavier disc moves in the x direction with velocity v = 25 m/s toward the lighter discs, which are at rest. The discs collide elastically. In the final state, the heavy disc is at rest and the two smaller discs scatter outward with the same speed. What is the xcomponent of the velocity of each of the 8 kg discs in the final state?  (A) 12.5 m/s (B) 16 m/s (C) 25 m/s (D) 50 m/s (E) 100 m/s

5. . An moving object has kinetic energy KE = 100 J and momentum p = 50 kg Â· m/s. What is its mass? (A) 2 kg (B) 4 kg (C) 6.25 kg (D) 12.5 kg (E) 25 kg

6. . An object of mass m moving with a velocity v collides with another object of mass M. If the two objects stick together, what is their velocity?  (A) (B) (C) (D) (E) Zero

7. . A body of mass m sliding along a frictionless surface collides with another body of mass m, which is stationary before impact. The two bodies stick together. If the kinetic energy of the two-body system is E, what is the initial velocity of the first mass before impact? (A) (B) (C) (D) (E)

8. . A hockey puck of mass m is initially at rest on a frictionless ice rink. A player comes and hits the puck, imparting an impulse of J. If the puck then collides with another object of mass M at rest and sticks to it, what is the final velocity of the two-body system? (A) (B) (C) (D) (E)

9. . Two 1 kg masses moving toward each other, one mass with velocity v1 = 10 m/s, the other with velocity v2 = 20 m/s. What is the velocity of the center of mass? (A) 0 m/s (B) 5 m/s to the left (C) 10 m/s to the left (D) 15 m/s to the left (E) 20 m/s to the left

10. . Two 1 kg masses moving toward each other, one mass with velocity v1 = 10 m/s, the other with velocity v2 = 20 m/s. What is the total energy of the system? (A) 50 J (B) 150 J (C) 200 J (D) 250 J (E) 400 J