

CLASS: PHY _____

STUDENT #: _____

NAME: _____

Assignment 7: Linear Momentum Q1 -Q8
Review Questions Q9-Q14

DO NOT RETURN THIS ASSIGNMENT TO THE DROP OFF BOX!
INSTEAD ENTER YOUR ANSWERS IN THE ASSIGNMENT 7 (
online assignment) ON VCI!

Work on this assignment during the study week. Once you figured all of the questions enter them into the online assignment answers template. Make sure that you are ready to do so. There will be just one attempt on this. Each question is worth 3points

Assigned: Oct 21 14:30

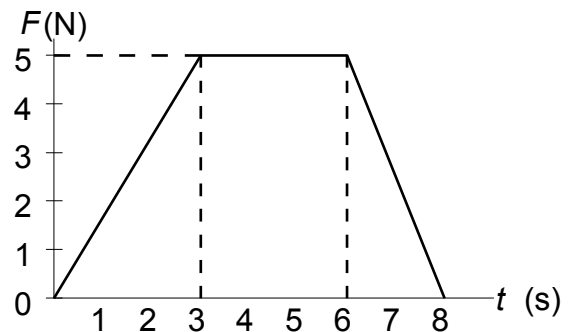
Due: Nov 2 22:00 Firm date: no extensions!

- 1 A 4.1 kg rifle is suspended by strings and fires a 0.0030 kg bullet at a speed of 1500 m/s. What is its recoil speed in m/s?

a. 0.99 b. 0.83 **c. 1.1** d. 1.4 e. 0.87

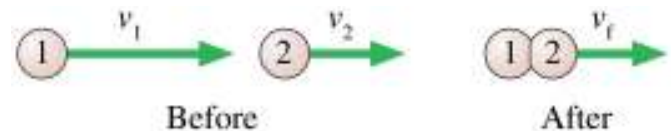
- 2 A 2.5 kg body moving horizontally with speed $v = 1\text{m/s}$ is acted on by a horizontal force as shown in the graph. What is the body speed at $x = 3\text{s}$?

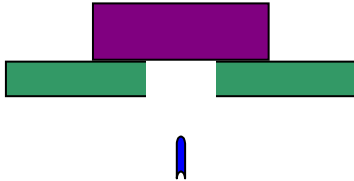
a) 1m/s
b) 2m/s
c) 3km/s
d) 4m/s
e) 5m/s



- 3 The two particles are both moving to the right. Particle 1 catches up with particle 2 and collides with it. The particles stick together and continue on with velocity v_f . Which of these statements is true?

A. $v_f = v_2$.
B. v_f is less than v_2 .
C. v_f is greater than v_2 , but less than v_1 .
D. $v_f = v_1$.
E. v_f is greater than v_1 .



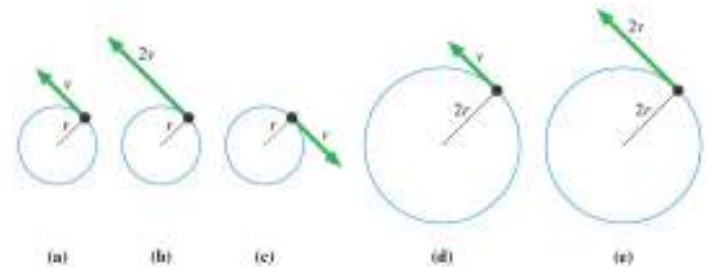
4. An explosion in a rigid pipe shoots out three pieces. A 6 g piece comes out the right end. A 4 g piece comes out the left end with twice the speed of the 6 g piece. From which end does the third piece emerge?
- ☒ A. Right end
B. Left end
C. Not enough information to answer this question
5. A 4.0-kg particle is moving horizontally with a speed of 5.0 m/s when it strikes a vertical wall. The particle rebounds with a speed of 3.0 m/s. What is the magnitude of the impulse delivered to the particle?
- a. 24 N · s
☒ b. 32 N · s
c. 40 N · s
d. 30 N · s
e. 8.0 N · s
6. A 2.0-kg object moving 5.0 m/s collides with and sticks to an 8.0-kg object initially at rest. Determine the kinetic energy lost by the system as a result of this collision.
- ☒ a. 20 J
b. 15 J
c. 30 J
d. 25 J
e. 5.0 J
7. A 10-g bullet moving 1000 m/s strikes and passes through a 2.0-kg block initially at rest, as shown. The bullet emerges from the block with a speed of 400 m/s. To what maximum height will the block rise above its initial position?
- a. 78 cm b. 66 cm c. 56 cm
☒ d. 46 cm e. 37 cm
- 
8. A 12-g bullet moving horizontally strikes and remains in a 3.0-kg block initially at rest on the edge of a table. The block, which is initially 80 cm above the floor, strikes the floor a horizontal distance of 120 cm from its initial position. What was the initial speed of the bullet?
- a. 0.68 km/s ☒ b. 0.75 km/s
c. 0.81 km/s d. 0.87 km/s
e. 0.41 km/s

PART II Review:

- 9 A cart on an air track is moving at 0.5 m/s when the air is suddenly turned off. The cart comes to rest after traveling 1 m. The experiment is repeated, but now the cart is moving at 1 m/s when the air is turned off. How far does the cart travel before coming to rest?
- a) 1 m b) 2 m c) 3 m **d) 4 m** e) 5 m
f) Impossible to determine

- 10 Rank in order, from largest to smallest, the magnitude of the centripetal accelerations $(ar)_a$ to $(ar)_e$ of particles a to e.

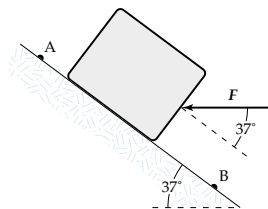
- A. $(ar)_b > (ar)_e > (ar)_a > (ar)_d > (ar)_c$
B. $(ar)_b > (ar)_e > (ar)_a = (ar)_c > (ar)_d$
 C. $(ar)_b = (ar)_e > (ar)_a = (ar)_c > (ar)_d$
 D. $(ar)_b > (ar)_a = (ar)_c = (ar)_e > (ar)_d$
 E. $(ar)_b > (ar)_a = (ar)_a > (ar)_e > (ar)_d$



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11. At what rate is the gravitational force on a 2.0-kg projectile doing work at an instant when the velocity of the projectile is 4.0 m/s directed 30° above the horizontal?
- a. +39 W
b. -78 W
c. -39 W
d. +78 W
e. +25 W
12. A 4.0-kg block is lowered down a 37° incline a distance of 5.0 m from point A to point B. A horizontal force ($F = 10$ N) is applied to the block between A and B as shown in the figure. The kinetic energy of the block at A is 10 J and at B it is 20 J. How much work is done on the block by the force of friction between A and B?

- a. -58 J
b. -53 J
c. -68 J
d. -63 J
e. -47 J



13. An airplane travels 80 m/s as it makes a horizontal circular turn which has a 0.80-km radius. What is the magnitude of the resultant force on the 75-kg pilot of this airplane?
- a. 0.69 kN
 - b. 0.63 kN
 - c. 0.66 kN
 - ☒ d. 0.60 kN
 - e. 0.57 kN
14. A 0.20-kg object attached to the end of a string swings in a vertical circle (radius = 80 cm). At the top of the circle the speed of the object is 4.5 m/s. What is the magnitude of the tension in the string at this position?
- a. 7.0 N
 - b. 2.0 N
 - ☒ c. 3.1 N
 - d. 5.1 N
 - e. 6.6 N