

Physics 1A– 10 AM class

Quiz # 4 Nov. 30, 2007

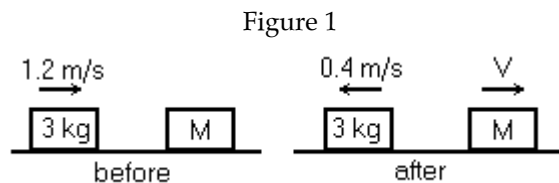
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MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Two skaters, both of mass 75 kg, are on skates on a frictionless ice pond. One skater throws a 0.3-kg ball at 5 m/s to his friend, who catches it and throws it back at 5 m/s. When the first skater has caught the returned ball, what is the velocity of each of the two skaters?
 - A) same as the beginning
 - B) 0.04 m/s, moving apart
 - C) 0.02 m/s, moving towards each other
 - D) 0.02 m/s, moving apart
 - E) 0.04 m/s, moving towards each other

- 2) A point on the rim of a 0.25-m-radius rotating wheel has a centripetal acceleration of 4.0 m/s^2 . What is the angular velocity of the wheel?
 - A) 1.0 rad/s
 - B) 6.0 rad/s
 - C) 3.2 rad/s
 - D) 2.0 rad/s
 - E) 4.0 rad/s

- 3) Jerome pitches a baseball of mass 0.20 kg. The ball arrives at home plate with a speed of 40 m/s and is batted straight back to Jerome with a return speed of 60 m/s. What is the magnitude of change in the ball's momentum?
 - A) 18 kg.m/s
 - B) 4.0 kg.m/s
 - C) 8.0 kg.m/s
 - D) 20 kg.m/s



A 3.0 kg block, moving on a frictionless surface with a speed of 1.2 m/s, makes a perfectly elastic collision with a block of mass M at rest. After the collision, the 3.0 kg block recoils with a speed of 0.4 m/s.

- 4) In Figure 1, the mass M is closest to:
 - A) 3.0 kg
 - B) 7.5 kg
 - C) 6.0 kg
 - D) 1.5 kg
 - E) 4.5 kg

- 5) In Figure 1, the speed of the block of mass M after the collision is closest to:
 - A) 1.4 m/s
 - B) 1.2 m/s
 - C) 1.0 m/s
 - D) 0.8 m/s
 - E) 1.6 m/s

- 6) A satellite is in a circular orbit about the Earth at a distance of one half of the Earth radius above the surface. What is the velocity of the satellite? (The radius of the Earth is $6.4 \times 10^6 \text{ m}$, the mass of the Earth is $5.98 \times 10^{24} \text{ kg}$, and $G = 6.67 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$.)
 - A) 9,100 m/s
 - B) 4,850 m/s
 - C) 6,450 m/s
 - D) 3,250 m/s
 - E) 19,400 m/s

- 7) During a snowball fight two balls with masses of 0.4 and 0.6 kg, respectively, are thrown in such a manner that they meet head on and combine to form a single mass. The magnitude of initial velocity for each is 15 m/s. What is the speed of the 1.0-kg mass immediately after collision?
- A) zero B) 3 m/s C) 6 m/s D) 9 m/s E) 12 m/s
- 8) A fan blade, initially at rest, rotates with a constant acceleration of 0.025 rad/s^2 . What is its angular speed at the instant it goes through an angular displacement of 4.2 rad?
- A) 0.025 rad/s B) 0.11 rad/s C) 0.46 rad/s D) 0.82 rad/s E) 1.20 rad/s

Answer Key

Testname: QUIZ4AC.TST

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) B
- 2) E
- 3) D
- 4) C
- 5) D
- 6) C
- 7) B
- 8) C