

Name ___CarDrez_____

Date _____

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1. Vector **A** = 6.0 m and points 30° east of north. Vector **B** = 4.0 m and point 30° west of south. The resultant vector **A+B** is given by
 - A) 10.0 m at an angle 60° north of east.
 - B) 10.0 m at an angle 30° east of north.
 - C) 2.0 m at an angle 30° north of east..
 - D) 2.0 m at an angle 60° north of east.
 - E) 1.0 m at an angle 60° east of north

2. In the absence of air friction, an object dropped near the surface of the Earth experiences a constant acceleration of about 9.8 m/s². This means that the
 - A) speed of the object increases 9.8 m/s during each second.
 - B) Speed of the object as it falls is 9.8 m/s.
 - C) Object falls 9.8 meters during each second.
 - D) Object falls 9.8 meters during the first second only.

3. Consider a car which is traveling along a straight road with constant acceleration *a*. There are two checkpoints A and B which are a distance 100 m apart. The time it takes for the car to travel from A to B is 5 s. Find the velocity difference, $\Delta v = v_B - v_A$ between the two checkpoints.
 - A) $\Delta v = 2a\Delta t$
 - B) $\Delta v = a\Delta t$
 - C) $\Delta v = a\Delta t/2$
 - D) $\Delta v = 1/(a\Delta t)$

4. A truck moves 70 m west, then moves 120 m east, and finally moves west again a distance of 90 m. If east is chosen as the positive direction, what is the truck's final displacement?
 - A) 40 m
 - B) -40 m
 - C) 280 m
 - D) -280 m
 - E) 170 m
 - F) -170 m

5. A child jumps with a speed of 20.0 m/s at an angle of 25.0° above the horizontal. What is the horizontal component of the child's velocity?
 - A) 18.1 m/s
 - B) 12.6 m/s

- C) 15.6 m/s
- D) 9.33 m/s
- E) 8.45 m/s

6. A rock is projected upward from the surface of the moon, at time $t = 0.0$ s, with a velocity of 30 m/s. The acceleration due to gravity at the surface of the moon is 1.62 m/s^2 . The time when the rock is ascending and at a height of 180 m is closest to:

- A) 12 s
- B) 8 s
- C) 23 s
- D) 30 s
- E) 17 s

7. A ball is pushed downhill with an initial velocity of 3.0 m/s. The ball rolls down a hill with a constant acceleration of 1.6 m/s^2 . The ball reaches the bottom of the hill in 6.0 s. What is the ball's velocity at the bottom of the hill?

- A) 10 m/s
- B) 18 m/s
- C) 16 m/s
- D) -6.6 m/s
- E) 13 m/s
- F) 19 m/s

8. A cheetah can run at approximately 100 km/hr and a gazelle at 80.0 km/hr. If both animals are running at full speed, with the gazelle 60.0 m ahead, how long before the cheetah can catch the gazelle?

- A) 6.30 s
- B) 2.16 s
- C) 2.70 s
- D) 25.6 s
- E) 11.5 s
- F) 10.8 s

9. A physics book is moved once around the perimeter of a table of dimensions 1 m by 3 m. If the book ends up at its initial position, what is its displacement?

- A) 1 m
- B) 8 m
- C) 4 m
- D) 6 m
- E) 0 m

10. A race car drives counter-clockwise around a circular track at a constant speed. When the car is at the easternmost point of the track, what is the direction of the car's velocity and acceleration vector?
- A) Velocity points north, Acceleration points north
 - B) Velocity points north, Acceleration points west
 - C) Velocity points west, Acceleration points west
 - D) Velocity points west, Acceleration points south
 - E) Velocity points north, Acceleration points south

