

Ch4MidYrReview

4.1 Conceptual Questions

- _____ 1) If a vector pointing upward has a positive magnitude, a vector pointing downward has a negative magnitude.
A) True
B) False
- _____ 2) Two displacement vectors have magnitudes of 5.0 m and 7.0 m, respectively. If these two vectors are added together, the magnitude of the sum
A) is equal to 2.0 m.
B) could be as small as 2.0 m or as large as 12 m.
C) is equal to 12 m.
D) is equal to 8.6 m.
- _____ 3) The magnitude of the resultant of two vectors cannot be less than the magnitude of either of those two vectors.
A) True
B) False
- _____ 4) If $\vec{A} - \vec{B} = 0$, then the vectors \vec{A} and \vec{B} have equal magnitudes and are directed in the same direction.
A) True
B) False
- _____ 5) The sum of two vectors of fixed magnitudes has the greatest magnitude when the angle between these two vectors is
A) 90°
B) 180°
C) 60°
D) 0°
E) 270°
- _____ 6) Which of the following statements are true about an object in two-dimensional projectile motion with no air resistance? (There could be more than one correct choice.)
A) The speed of the object is constant but its velocity is not constant.
B) The acceleration of the object is $+g$ when the object is rising and $-g$ when it is falling.
C) The acceleration of the object is zero at its highest point.
D) The speed of the object is zero at its highest point.
E) The horizontal acceleration is always zero and the vertical acceleration is always a non-zero constant downward.
- _____ 7) A ball is thrown horizontally from the top of a tower at the same instant that a stone is dropped vertically. Which object is traveling faster when it hits the level ground below if neither of them experiences any air resistance?
A) It is impossible to tell because we do not know their masses.
B) the stone
C) the ball
D) Both are traveling at the same speed.

- _____ 8) A pilot drops a package from a plane flying horizontally at a constant speed. Neglecting air resistance, when the package hits the ground the horizontal location of the plane will
- A) be behind the package.
 - B) be directly over the package.
 - C) be in front of the package.
 - D) depend on the speed of the plane when the package was released.
- _____ 9) A player kicks a soccer ball in a high arc toward the opponent's goal. At the highest point in its trajectory
- A) both the velocity and the acceleration of the soccer ball are zero.
 - B) neither the ball's velocity nor its acceleration are zero.
 - C) the ball's acceleration is zero but its velocity is not zero.
 - D) the ball's acceleration points upward.
 - E) the ball's velocity points downward.
- _____ 10) A rock is thrown from the upper edge of a tall cliff at some angle above the horizontal. It reaches its highest point and starts falling down. Which of the following statements about the rock's motion are true just before it hits the ground? (There could be more than one correct choice.)
- A) Its horizontal velocity component is zero.
 - B) Its velocity is vertical.
 - C) Its vertical velocity component is the same as it was just as it was launched.
 - D) Its horizontal velocity component is the same as it was just as it was launched.
 - E) Its speed is the same as it was just as it was launched.
- _____ 11) You are trying to cross a river that flows toward the south with a strong current. You start out in your motorboat on the east bank desiring to reach the west bank directly west from your starting point. You should head your motorboat
- A) directly toward the west.
 - B) directly toward the north.
 - C) in a general southwesterly direction.
 - D) in a general northwesterly direction.

4.2 Problems

- 12) A vector \vec{A} has components $A_x = 12.0$ m and $A_y = 5.00$ m.
- (a) What is the angle that vector \vec{A} makes with the $+x$ -axis?
 - (b) What is the magnitude of vector \vec{A} ?
- _____ 13) A car travels 20 km west and then 20 km south. What is the magnitude of its displacement vector?
- A) 0 km
 - B) 20 km
 - C) 28 km
 - D) 40 km

Name: _____

ID: A

- _____ 14) A stone is thrown horizontally with an initial speed of 10 m/s from the edge of a cliff. A stopwatch measures the stone's trajectory time from the top of the cliff to the bottom to be 4.3 s. What is the height of the cliff if air resistance is negligibly small?
- A) 22 m
 - B) 43 m
 - C) 77 m
 - D) 91 m
- _____ 15) A girl throws a rock horizontally, with a velocity of 10 m/s, from a bridge. It falls 20 m to the water below. How far does the rock travel horizontally before striking the water, assuming negligible air resistance?
- A) 14 m
 - B) 16 m
 - C) 20 m
 - D) 24 m

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Answer Section

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|------------|-------------|-------------|
| 1) ANS: B | PTS: 1 | REF: Var: 1 |
| 2) ANS: B | PTS: 1 | REF: Var: 1 |
| 3) ANS: B | PTS: 1 | REF: Var: 1 |
| 4) ANS: A | PTS: 1 | REF: Var: 1 |
| 5) ANS: D | PTS: 1 | REF: Var: 1 |
| 6) ANS: E | PTS: 1 | REF: Var: 1 |
| 7) ANS: C | PTS: 1 | REF: Var: 1 |
| 8) ANS: B | PTS: 1 | REF: Var: 1 |
| 9) ANS: B | PTS: 1 | REF: Var: 1 |
| 10) ANS: D | PTS: 1 | REF: Var: 1 |
| 11) ANS: D | PTS: 1 | REF: Var: 1 |
| 12) ANS: | | |
| (a) 22.6° | (b) 13.0 m | |
| PTS: 1 | REF: Var: 1 | |
| 13) ANS: C | PTS: 1 | REF: Var: 1 |
| 14) ANS: D | PTS: 1 | REF: Var: 1 |
| 15) ANS: C | PTS: 1 | REF: Var: 1 |