Prince Sultan University
Orientation Mathematics Program
PHY 105 Midterm Examination
Semester I, Term 091

PHY 105 First Exam Nov. 9th 2009
H.S.

Part 1: ***(1 point each)***

1. A car traveling with velocity ***v*** is decelerated by a constant acceleration of magnitude ***a***. It travels a distance ***d*** before coming to rest. If its initial velocity were **doubled**, the distance required to stop would

A) double as well. B) decrease by a factor of two.
C) stay the same. D) quadruple.
E) decrease by a factor of four.

2. A stone is thrown straight up. When it reaches its highest point,

A) both its velocity and its acceleration are zero.
B) its velocity is zero and its acceleration is not zero.
C) its velocity is not zero and its acceleration is zero.
D) neither its velocity nor its acceleration is zero.
E) cannot determine.

3. A car is moving with a speed of **32.0 m/s**. The driver sees an accident ahead and slams on the brakes, giving the car a deceleration of **3.50 m/s^2**. How far does the car travel after the driver put on the brakes before it comes to a stop?

A) 4.57 m B) 9.14 m C) 112 m D) 146 m E) 292 m

4. If the acceleration vector of an object is directed anti-parallel to the velocity vector, then

A) the object is speeding up. B) the object is slowing down.
C) the object is turning. D) the object is at rest.
E) the object is moving with a constant velocity.

5. A person walks **8.0 m** in a straight line east of north and ends up **4.0 m** east and a certain distance north. How many degrees east of north has the person walked?

A) 30° B) 45° C) 60° D) 75° E) 90°

6. A boy jumps at a speed of **20.0 m/s** at an angle of **25.0°** above the horizontal. What is the horizontal component of the boy's velocity?

A) 18.1 m/s B) 15.6 m/s C) 8.45 m/s D) 12.6 m/s E) 9.33 m/s

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7. A ball rolls off the edge of a table with an initial velocity of **20 m/s.** The height of the table above the ground is **2.0 m**. How long does it take the ball to reach the ground?

A) 0.49 s B) 0.98 s C) 0.64 s D) 2.0 s E) 0.32 s

8. A pilot drops a bomb from a plane flying horizontally at a constant speed. Neglecting air resistance, when the bomb hits the ground the horizontal location of the plane will

A) be behind the bomb. B) be over the bomb.
C) be in front of the bomb.
D) depend of the speed of the plane when the bomb was released.
E) depend of the mass of the bomb when it was released.

9. A person throws a ball horizontally from the top of a building that is **24.0 m** above the ground level. The ball lands **100 m** down range from the base of the building. What was the initial velocity of the ball?

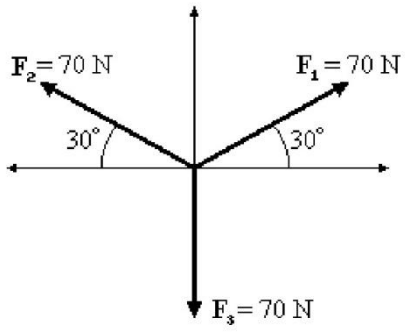
A) 202 m/s B) 9.82 m/s C) 19.6 m/s D) 45.2 m/s E) 94.4 m/s

10. An athlete competing in long jump leaves the ground with a speed of **9.14 m/s** at an angle of **35.0°** above the horizontal. What is the length of the athlete's jump?

A) 0.876 m B) 8.01 m C) 12.0 m D) 16.8 m E) 4.01 m

<u>Part 2:</u> For the following problems, please show your work in the space provided to receive partial credit. ***(3 points each)***

P. 1. Refer to the Figure below. Three forces $\vec{F}_1 = \vec{F}_2 = \vec{F}_3 = 70$ N are acting on an object at the origin as shown in the figure. What is the resultant force acting over the object?



Answer:_____(with units)

P. 2. A child throws a ball with an initial speed of **8.00 m/s** at an angle of **40.0°** above the horizontal. The ball leaves her hand **1.00 m** above the ground. At what angle below the horizontal does the ball approach the ground?

Answer:_____(with units)

Good Luck