



Department of Mathematics
and General Sciences

Physics 1 (PHY105)
First Major Exam

First Semester, Term 141
Date: Sunday 26/10/2013

Name:	
ID number:	
Section number (or time):	
Instructor's name:	

Important instructions:

1. Examination time: 60 minutes.
2. Write your name before starting with the questions.
3. Switch off your mobile phone and put any books and notes away.
4. You should have 5 pages in total
5. You may *not* borrow a calculator.
6. Use $g = 9.8 \text{ m/s}^2$.

Good Luck!

	Mark
Part 1	
Part 2	
Total	

Part 1 (10 points):

Indicate the answer choice that best completes the statement or answers the question.

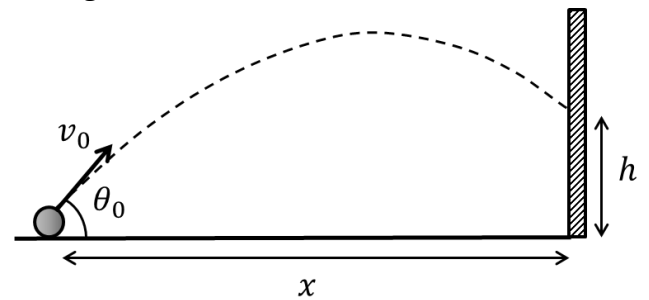
- ___ 1. Which one of the choices below represents the preferred practice regarding significant figures when adding the following: $12.3 + 12 + 88.16 + 2.218$?
- a) 114.7 b) 115 c) 114.678 d) 114.6780
- ___ 2. The slope of the tangent line to the the velocity vs. time curve at a given time represents:
- a) the instantaneous acceleration at that time. b) the instantaneous velocity at that time c) the average velocity. d) the average acceleration.
- ___ 3. Omar throws a rock down with speed 13 m/s from the top of a tower. The rock hits the ground after 2 s. What is the height of the tower? (air resistance is negligible)
- a) 23 m b) 83 m c) 37 m d) 46 m
- ___ 4. A ball is thrown. At what point is the magnitude of the acceleration at a minimum? (air resistance is negligible)
- a) acceleration is constant during entire path b) just before hitting the ground c) just after leaving the thrower's hand d) at the top of the path
- ___ 5. Which of the following is not a vector quantity?
- a) acceleration b) velocity c) displacement d) speed
- ___ 6. A jogger runs halfway around a circular path with a radius of 52 m. What is the magnitude of his displacement?
- a) 104 b) 52 m c) 163 m d) 0 m
- ___ 7. If a is acceleration, v is velocity, x is position, and t is time, then which equation is not dimensionally correct?
- a) $t = x/v$ b) $t^2 = 2x/a$ c) $a = v^2/x$ d) $v = a/t$
- ___ 8. A railroad train travels forward along a straight track at 90 m/s for 1000 m and then travels at 60 m/s for the next 1000 m (in the same direction). What is its overall average velocity?
- a) 77.0 m/s b) 72.5 m/s c) 72.0 m/s d) 75 m/s
- ___ 9. An Ant travels 30 cm eastward, then 30 cm northward, and finally 5 cm westward. What is the Ant's direction of displacement with respect to its original position?
- a) 50° North of East b) 45° North of West c) 40° North of West d) 130° North of East
- ___ 10. A European sports car dealer claims that his product will accelerate at a constant rate from rest to a speed of 100 km/hr in 6 s. What distance will the sports car travel during the 6 s acceleration period?
- a) 41.5 m b) 166 m c) 58.1 m d) 83 m

Part 2 (5 points):

Solve the following two problems in the provided space. *Show your steps and include the appropriate units.*

- Q1. (2 points) A car starting from rest accelerates at a constant rate of 2 m/s^2 for 100 meters. The driver then applies the brakes, causing the car to decelerate at a constant rate. The car stops completely 4 seconds after applying the brakes.
- a) Calculate the velocity of the car just before the brakes were applied.
 - b) What is the total distance the car has traveled?

- Q2. (3 points) A ball is kicked from the ground at an angle of $\theta_0 = 45^\circ$ from the horizontal towards a wall located $x = 20$ m away, as shown in the figure. The ball hits the wall 2 seconds later. Calculate:
- a) the initial speed of the ball v_0
 - b) the height at which the ball hits the wall h
 - c) the speed and direction of the ball just before hitting the wall



Scratch sheet. Keep attached