Physics 111
Assignment # 1 – Kinematics
Due

Multiple Choice

1. Do the questions on schoology.com

Open Response (Show your work)

1. Tim is driving on his bike at a velocity of 5m/s when he starts to speed up with an acceleration of 4.00 m/s^2. At the same instant that he starts to accelerate, a truck traveling in the same direction with a constant speed of 15.0 m/s passes in the next lane. (a) What minimum distance will the Tim have to travel in order to catch up with the truck? (b) What speed will the Tim be going when it catches up with the truck? c) How much longer would it take Time to catch the truck if he waited for 2 seconds before he started to accelerate? (Be careful, this isn't quite as easy as it seems!)
2. A ball is thrown upward from the top of a building with an initial velocity of 36km/h. Determine a) how high the building is if it hits the ground at 90km/h. b) How long it takes to hit the ground.
3. Herman drives his four-wheeler from his house to his neighbor's house which is 2.0km away with an average velocity of 72km/h. He then turns around and drives home with an average speed of 90km/h but stops at the store which is 500m from his house a) How long did it take to drive to his neighbor's house? b) How long did it take to get from his neighbor's house to the store? b) What is his average velocity for the total trip?
4. Sketch P-t and V-t graphs for the following situations:
    a. Anna is headed west and is increasing her velocity
    b. Bradford is heading at a constant velocity in a west direction
    c. Caleb is travelling east at a constant velocity then slows to a stop
5. Explain why the acceleration of gravity is negative. Does the acceleration of gravity slow objects down or cause them to speed up. Support your answer.
6. As you look out of your apartment window, a flower pot suddenly falls past. The window is = 1.50 m tall and the pot is visible for t = 0.20 s. The flower pot was dropped accidentally from a higher floor, a distance h above the bottom of the window. The bottom of the window is a distance 3.5m above the ground.

    a. Calculate the distance h.
    b. Calculate the speed of the flower pot when it hits the ground.

Practice Questions:

1. A small single engine plane is flying west and lands on a runway traveling at a magnitude of 237.6km/h and is decelerated uniformly to rest in 10.0 sec. (a) Calculate the plane's acceleration. (b) Determine the displacement of the plane while it is stopping. **(6.6m/s^2, -330m)**
2. A commuter train is accelerated from rest at a constant rate of 0.80m/s^2 for 1.00 min. a) How far does it travel during this time? b) What is its velocity after 1.00min? c) After the first minute it maintains a constant velocity. What is the total displacement of the train after 4 minutes? **(1440m, 172.8km/h, 1.01x10^{4}m)**
3. A firework is shot straight into the air with an initial velocity of 50m/s. What is the approximate maximum height it reaches? (AP type question – round g to 10m/s^2) **(125m)**
4. Ophelia throws a ball upward with a velocity of 10m/s from the top of her school. The top of the school is 12m high and she releases it 1m above the height of the roof. How long would it take to hit the ground? **(2.94 sec)**
5. Brendan is in his car travelling at a constant velocity of 108km/h east. At the same time Jacob is in his car also travelling east but at 126km/h. How long would it take Jacob to catch Brendan if he starts 1km behind him? How far would Jacob travel during this time? **(3min,20sec, 7km)**

See the Physics 112 Assignment for more options.