Copying Is Not Allowed.

HW 2.2 Kinematics Per_____ Name____

1. A bullet moving horizontally with a velocity of 40.0 m/s strikes a sandbag and penetrates a distance of 20.0 **cm** before coming to rest.

   (a) What is the acceleration of the bullet?

   (b) How much time does it take for the bullet to come to rest?

2. How long must an airstrip be so that an airplane can take off, if the plane must have a speed of 135 **km/hr**? Assume the plane starts from rest and will have a constant acceleration of 2.5 m/s/s.

3. A dragster traveling with a velocity of 40 m/s begins uniformly slowing using a parachute and a braking system and comes to rest 5 seconds later.

   (a) Determine the acceleration of the car.

   (b) How far does the car travel after the acceleration starts?

4. A DC-8 has a take off speed of 80 m/s which it reaches 30 seconds after starting from rest. How much time does the airplane spend in going from 0 m/s to 20 m/s?

5. A gazelle on in-line roller skates travels at a speed of 4.5 m/s along the top of a hill. The gazelle then skates downhill with an average acceleration of 0.85 m/s^2. If its final speed is 10.8 m/s, how long does it take the gazelle to skate down the hill?

6. A gazelle runs with an initial velocity of 1.50 m/s to the right on a waxed floor. It slides to a final velocity of 0.30 m/s to the right with a uniform acceleration of 0.35 m/s/s to the left. What is the gazelle's displacement?

7. A baseball pitcher playing for the gazelle minor league team releases a fastball with a velocity of 44 m/s. The pitcher accelerates the ball from rest through a distance of about 3.5 meters from behind his body to the point where it is released. What is the acceleration of the ball?