

## Kinematics Worksheet 4

- (1) A truck accelerates from rest at  $3.6 \text{ m/s}^2$ . If it accelerates for 2.8s, how far does it travel?
- (2) A landing plane hits the runway and applies the brakes. If the plane manages to stop at the end of a 850m runway and the brakes apply a constant acceleration of  $12.9 \text{ m/s}^2$ , at what velocity did the plane land?
- (3) A car accelerates from rest at  $3.75 \text{ m/s}^2$  over a distance of 64.2 m.
  - a. How long does this take?
  - b. What is the car's final speed?
- (4) A bird changes its position from 350 m [N] to 165 m [S] with an acceleration of  $4.75 \text{ m/s}^2$  [S]. If its initial velocity was  $3.75 \text{ m/s}$  [N], find:
  - a. The bird's final speed
  - b. How long this trip takes the bird
- (5) A rifle shoots a bullet with a muzzle velocity of  $375 \text{ m/s}$ . If the bullet's speed after 2.6 s was  $314 \text{ m/s}$ , find:
  - a. The bullet's acceleration
  - b. How far the bullet will have travelled after 7.0 s

Physics 2204 Worksheet 5

(1) A bullet is fired from a rifle with a velocity of 152 m/s. If it comes to a stop 2250 m away, what was the bullet's acceleration?

(2) A rocket car is trying to set a new land speed record. The car has an acceleration of  $22 \text{ m/s}^2$  and contains enough fuel to travel for 9.5s.

- a. What will the maximum speed of the car be?
- b. How far will the car travel?

(3) To take off, an airplane must reach a speed of 95.0 m/s. A certain airplane tries to take off on a 450 m runway and has an acceleration of  $12.5 \text{ m/s}^2$ . Will the airplane take off successfully?

- (4) a. A rocket is shot straight up at 100.0 m/s. How high will the rocket go?
- b. How long will it take the rocket in #1 above to reach the ground again?
- c. What is the rocket's position after 5.76 s?

(5) a. Wile E Coyote is now trying to use his trusty acme catapult to launch himself after the roadrunner. Unfortunately, instead of launching himself along the ground, the catapult launches him straight up at 250.0 m/s! Unfortunately for Wile E Coyote, instead of open air above his head, there is a large stone overhang! If he strikes the overhang after 3.2 s, how high is the overhang?

b. How fast is he traveling when he reaches the overhang?

(6) Wile E Coyote is using a rocket-powered skateboard to chase after the roadrunner. He is travelling at 25.0 m/s when he sees the roadrunner and starts speeding up. If the acceleration of the skateboard is  $15.5 \text{ m/s}^2$  and there is a cliff 2.50 km away, how long will it take Wile E Coyote to hit the cliff?

## Physics Worksheet 6

- (1) A truck travelling at 2.5 m/s accelerates for 5.6s. If the truck travels 45m in that time, what was its acceleration?
- (2) A man drops a rock from a 35.0 m high bridge. How fast is it moving when it hits the ground?
- (3) A bird flying at 3.65 m/s slows down to 2.56 m/s in preparation to land. If it covers 13.2 m, how long does it take the bird to slow down?
- (4) A car travelling at an unknown speed slams on the breaks. The car is able to break with an acceleration of  $7.56 \text{ m/s}^2$ . If it breaks for 3.6 s and covers a distance of 84.6 m, how fast was the car travelling?
- (5) A ball is thrown downwards at 6.61 m/s off a bridge. If it hits the ground with a speed of 35.3 m/s, how high was the bridge?
- (6) A man is on top of a 12.0 m high roof. He throws a ball upwards at 20.0 m/s. The ball falls all the way to the ground.
  - a. How far off the ground does the ball travel?
  - b. How fast is it moving just as it hits the ground?
  - c. How long does it take for the ball to reach the ground
- (7) A car moving down the road at 25.0 m/s sees duck on the road and hits the breaks. He slows his speed to 15.5 m/s in 2.30 s. If he just manages to avoid hitting the duck, how far away was it?