Name: Block:

Physics 11

Mr. Ali Bustanji

Uniformly Accelerated Motion

1. An airplane increases its speed from 120 m/s to 160 m/s at the average rate of 8.0 m/s^2. How much time does it take for the complete increases in speed?

2. A car travelling 60.0 km/h accelerates at the rate of 2.0 m/s^2. How much time is required for the car to reach a speed of 90.0 km/h?

3. A ball is thrown upwards at a velocity of 20.0 m/s. What is its velocity after 3.0 s?

4. A flowerpot falls from a window 36.0 m above the ground.
   a) How fast is it moving when it hits the ground?
   b) How long did it take to hit the ground?

5. A Social Studies textbook is dropped out the window and takes 2.1 s to hit the ground. How high above the ground is the window?

6. A car goes from 40. m/s to 80. m/s in a distance of 200. m. What is its acceleration during this time?

7. A tennis ball is thrown upward and reaches a height of 99.0 m. What was the initial velocity of the ball?

8. An object travelling east goes from 14.0 m/s to 4.0 m/s in 10.0 s with constant acceleration. What is the acceleration?

9. A jet fighter plane is launched from a catapult on an aircraft carrier. After 2.0s, it reaches the end of the catapult with a speed of 42 m/s. Assuming the acceleration is constant, what is the length of the catapult?

10. A car with good tires on a dry road can decelerate at about 5.0 m/s^2 when braking. If the car is travelling at 89.5 km/h,
    a) how long does it take the car to stop under these conditions?
    b) how far does the car travel during this time?

11. A bullet shot straight up returns to its starting point in 10.0 s. What was it's initial speed?

12. A ball is thrown straight up with a speed of 36 m/s. How long does it take to return to its starting point?

13. A brick is thrown downward with from the top of a building with an initial speed of 25 m/s. It strikes the ground after 2.0s. How high is the building?

14. A bullet moving horizontally with a speed of 5.00×10^2 m/s strikes a sandbag and penetrates a distance of 10.0 cm.
    a) What is the average acceleration of the bullet?

b) How long does it take for the bullet to come to rest?

15. A car decelerates uniformly and comes to a stop after 10.0 s. The car's average velocity during the negative acceleration was 15 m/s. What was the car's acceleration while slowing down?

16. A toy rocket is launched with an acceleration of 10.0 m/s^2 upwards for 3.0 s. It then slows down with an acceleration of 10.0 m/s^2 in the opposite direction until it reaches its maximum altitude. How high does it go?

17. A car, starting from rest, moves with constant acceleration of 2.0 m/s^2 for 10.0 s, then travels with constant speed for another 10.0 s, and then finally slows to a stop with a constant acceleration of 2.0 m/s^2 in the opposite direction. How far does it travel?

18. A car travelling 30.0 m/s is able to stop in a distance *d*. Assuming the same acceleration, what distance does this car require to stop when it is travelling twice as fast?

19. An object travels at 4.0 m/s for 25 s and then at 20.0 m/s for 15 s. What is the average speed?

20. A car starts from rest and accelerates uniformly at 3.0 m/s^2. A second car starts from rest 6.0 s later at the same point and accelerates uniformly at 5.0 m/s^2. How long does it take the second car to overtake the first car?