Motion

Solve the following problems. Show all your work. Remember to include the correct units.

1. A student practicing for a track meet ran 250 meters in 30 seconds.

   a. What was her average speed?

   b. If on the following day she ran 300 meters in 30 seconds, by how much did her speed increase?

2. A car traveled 1025 kilometers from El Paso to Dallas in 13.5 hours. What was its average velocity?

3. How fast was a plane flying if it traveled 400 kilometers in 30 minutes?

4. A student walks 10 blocks to a computer store. (Assume all the blocks are equal length.)

   a. How long will it take him to reach the computer store if he walks 3 blocks in 2 minutes?

   b. What is his average velocity?

5. If the average speed of a car is 45 km/hr, how far can it travel in 40 min?

6. The speed of light is 3×10^8 m/sec. How long does it take light to travel the 149×10^9 m distance from the sun to the earth?

7. A driver starts his parked car and within 5 seconds reaches a velocity of 54 km/hr as he travels east. What is his acceleration?

8. Falling objects drop with an average acceleration of 9.8 m/sec/sec, or 9.8 m/sec². If an object falls from a tall building, how long will it take before it reaches a speed of 49 m/sec?

9. A car traveling north with a velocity of 30 meters per second slows down to a velocity of 10 meters per second within 10 seconds. What is the car's deceleration?

10. A steel ball whose mass is 100 g is rolling at a rate of 2.8 m/sec. What is its momentum?

11. A marble is rolling at a velocity 100 cm/sec with a momentum of 10,000 g-cm/sec. What is its mass?

12. A projectile whose mass is 3 kg is fired from a cannon, giving it a forward momentum of 1050 kg-m/sec. What is its velocity?