Physics 112
Distance, Displacement, Speed, and Velocity Practice

1. Sam is driving along the highway towards Saint John. He travels 150km in 3.00hrs. What is his average speed for his trip? (50 km/h)

2. A vehicle travels 2345 m [W] in 315 s toward the evening sun. What is its average velocity? (7.4 m/s [W])

3. What distance will a car, traveling 65 km/hr, cover in 3.0 hrs? (195 km)

4. How long will it take to go 150 km [E] traveling at 50 km/hr [E]? (3.0 hr)

5. What is the displacement of the Earth after one orbit about the Sun? What is the average velocity of the Earth after one orbit in m/s? (0 m; 0 m/s)

6. What is the average velocity of the Earth the instant it has traveled half of its circular orbit about the Sun in m/s? (v_{avg} = 19 025 m/s)

7. Calculate the average speed of the Earth about the Sun in m/s. (29 885 m/s)

8. How long will it take to travel 200 000 m [N] traveling 10 m/s [N]? (20 000 s)

9. A car drives 12 m/s [S] for 5.0 seconds, then 18 m/s [N] for 9.0 seconds, and finally 15 m/s [S] for 11 seconds. Calculate the average speed and average velocity. (v_{sp} = 15.5 m/s; v_{avg} = -2.5 m/s or 2.5 m/s [S])

10. A soccer ball is kicked 25 m [E], then 15 m [E], 8 m [W], and finally 12 m [E]. All this takes place in 45 seconds. Calculate the average speed and velocity of the ball. (v_{sp} = 1.3 m/s; v_{avg} = +0.98 m/s [E])

Acceleration Practice

1. A roller coaster car rapidly picks up velocity as it rolls down a slope. As it starts down the slope, its velocity is 4 m/s. But 3 seconds later, at the bottom of the slope, its velocity is 22 m/s. What is its average acceleration?

2. A car accelerates at a rate of 3.0 m/s^2. If its original velocity is 8.0 m/s, how many seconds will it take the car to reach a final velocity of 25.0 m/s?

3. A cyclist accelerates from 0 m/s to 8 m/s in 3 seconds. What is his acceleration? Is this acceleration higher than that of a car which accelerates from 0 to 30 m/s in 8 seconds?

4. The final velocity of a car is 30m/s. The car is accelerating at a rate of 2.5m/s^2 over an 8 second period of time. What is the initial velocity of the car?

5. If a Ferrari, with an initial velocity of 10 m/s, accelerates at a rate of 50 m/s^2 for 3 seconds, what will its final velocity be?

6. A car traveling at a velocity of 30.0 m/s encounters an emergency and comes to a complete stop. How much time will it take for the car to stop if its rate of deceleration is -4.0 m/s^2?

7. A cart rolling down an incline for 5.0 seconds has an acceleration of 4.0 m/s^2. If the cart has a beginning velocity of 2.0 m/s, what is its final velocity?

8. A parachute on a racing dragster opens and changes the velocity of the car from 85 m/s to 45 m/s in a period of 4.5 seconds. What is the acceleration of the dragster?

9. A motorcycle traveling at 25 m/s accelerates at a rate of 7.0 m/s^2 for 6.0 seconds. What is the final velocity of the motorcycle?

10. A skier accelerates at a rate of 4.6m/s^2 for 4.5s. What is his initial velocity if his final velocity is 21m/s?