Some examples of accelerated motion problems

1. A sprinter starts from rest and covers a distance of 40 meters in 5 seconds.

The acceleration of the sprinter is constant during this time.

(a) What is the acceleration of the sprinter?

(b) What is the speed of the sprinter at the 40-meter mark?

(c) How far did the sprinter move during each second?

2. A car is 30 meters left of a sign. The car is moving right at 20 m/s at

this point. The car slows at 2 m/s2. Assign the reference point at the sign.

(a) What is the position of the car at *t* *= 0*?

(b) What is the velocity of the car after moving for 8 seconds?

(c) What was the displacement of the car during the 8 seconds?

(d) What is the position of the car after the 8 seconds?

3. A cart is moving in the negative direction at 4 m/s. The cart hits a spring and

rebounds at 3 m/s. The cart is in contact with the spring for 0.35 seconds.

(a) What was the average acceleration of the cart during the

time the cart was in contact with the spring?

(b) How much time did the spring need to stop the cart?

(c) What was the maximum distance the spring was compressed by the cart?

4. A ball has a speed of 4 m/s at the bottom of a ramp. The ball experiences an

acceleration of 2 m/s2 as it rolls on the ramp.

(a) For how much time will the ball roll up the ramp?

(b) What are the velocity and speed of the ball when the ball is 1 meter

up the ramp?

(c) How much time does the ball take to roll up the ramp

and back down to the bottom of the ramp?

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