PHYSICS 12

NAME: _____

Kinematics II

1) A car traveled up a hill at constant speed of 10.0 m/s and then returned down the hill at 20.0 m/s. If the time to turn around is ignored, what was the average speed for the trip?

2) A late passenger, sprinting at 8 m/s, is 30 m away from the rear end of a train when it starts out of the station with uniform acceleration of 1 m/s^2. Can the passenger catch the train if the platform is long enough?

Assignment

3) A ball is thrown vertically up at 3.0 m/s off the edge of a 12 m cliff. How long will it take for the ball to hit the ground at the bottom of the cliff?

4) A stone is thrown vertically upward with a speed of 10.0 m/s from the edge of a cliff 65 m high. a) How much later does it reach the bottom of the cliff? b) What is its speed just before hitting? c) What total distance did it travel?

5) A 90 m long train begins accelerating from rest. The front of the train passes a railway worker, who is standing 200 m from where the front of the train started, at a speed of 25 m/s. What will be the speed of the last car as it passes the worker?

6) An arrow is fired at an apple 25.0 m away. If the sound of the arrow piercing the apple is heard 0.75 s later, how fast did the arrow travel? Assume the speed of sound is 330 m/s.

Enrichment

7) A race car driver must average 200 km/h for four laps to qualify for a race. Because of engine trouble, the car averages only 170 km/h over the first two laps. What average speed must be maintained for the last two laps?

8) A rock is dropped down a deep well and the sound of it striking the water is heard 3.0 s later. If the speed of sound is 340 m/s, how deep is the well?

9) A falling stone takes 0.30 s to travel past a window 2.4 m tall. From what height above the top of the window did the stone fall?

Answers: 1) 13.3 m/s, 2) yes, t=6 s or 10 s, 3) 1.9s, 4) 4.8 s, -37 m/s, 75.2 m, 5) 30.1 m/s, 6) 37.1 m/s, 7) 243 km/h, 8), 41 m 9) 2.17 m