Chapter 2 Pretest: (+1) Name _____

1. During an Apollo moon landing, reflecting panels were placed on the moon. This allowed earth-based astronomers to shoot laser beams at the moon's surface to determine its distance. The reflected laser beam was observed 2.52 s after the laser pulse was sent. If the speed of light is 3.00×10^8 m/s, what was the distance between the astronomers and the moon?

2. A tortoise and a hare are in a road race to defend the honor of their breed. The tortoise crawls the entire 1000 m distance at a speed of 0.2000 m/s while the rabbit runs the first 200 .0 m at 2.000 m/s. The rabbit then stops to take a nap for 1.300 h and awakens to finish the last 800.0 m with an average speed of 3.000 m/s. a) Who wins the race and by how much time? b) Draw a graph of distance vs. time for the situation.

3. Two physics professors challenge each other to a 100 m race across the football field. The loser will grade the winner's physics labs for one month. Dr. Nelson runs the race in 10.40 s. Dr. Bray runs the first 25.0 m with an average speed of 10.0 m/s, the next 50.0 m with an average speed of 9.50 m/s, and the last 25.0 m with an average speed of 11.1 m/s. Who gets stuck grading physics labs for the next month?

4. In the Wizard of Oz, Dorothy awakens in Munchkinland where her house has been blown by a tornado. If the house fell from a height of 3000 m, with what speed did it hit the Wicked Witch on the East when it landed?

5. Chief Boolie, the jungle dweller, is out hunting for dinner when a coconut falls from a tree and lands on his toe. If the nut fell for 1.4 s, how fast was it traveling when it hit Chief Boolie's toe?

6. At Great Adventure Amusement Park in New Jersey, a popular ride known as "Free Fall" carries passengers up to a height of 33.5 m and drops them to the ground inside a small cage. How fast are the passengers going at the bottom of this exhilarating journey?

7. A car accelerates uniformly from rest to a speed of 65 km/h (18 m/s) in 12 s. Find the distance the car travels during this time.

8. A car traveling at +7.0 m/s accelerates at the rate of $+0.80\ m/s^2$ for an interval of 2.0 s. Find final velocity.

9. Perhaps sometime in the future, NASA will develop a program to land a human being on Mars. If you were the first Mars explorer and discovered that when you dropped a hammer it took 0.68 s to fall 0.90 m to the ground, what would you calculate for the gravitational acceleration on Mars?