**How Far III**

Directions: Show the solutions (i.e. your work) to these on a separate sheet of paper.

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| 3.74 s  +36.7 m/s  -36.7 m/s  68.5 m  +19.1 or -19.1 m/s | 1. Helen Wheels launches a rocket in the air for a total of 7.48 seconds. What time did it spend going up? What is its initial velocity? What is its final velocity? How high did it go? What is the rocket's velocity at an elevation of 50.0 m? (Why are there two answers?) |
| 525 s  14.2 km | 2. A Honda driven by Cliff Jumper going 27 m/s is 2.1 kilometers (km) behind another Pinto driven by Ima Sloe going 23 m/s in the same direction. What time will it take the Cliff to overtake Ima? What distance will the Cliff travel in this time? |
| 12.8 m/s  -24.3 m/s  8.3 m  -8.0 m/s  +5.1 m | 3. Freda Heitz throws a ball up from the roof of a building at a height of 21.7 m. It strikes the ground 3.78 seconds later. What is the initial velocity of the ball? With what velocity does the ball hit the ground? How high above the building does the ball go? What is the velocity and displacement 2.12 seconds after the ball was released? |
| 4.74 s  -33.1m/s  110 m | 4. Catona Hotinruff is ascending in a helicopter at a rate of 13.3 m/s. At an elevation of 47.0 m, she drops a bagel out the window of the 'copter. What time does the bagel take to reach the ground? What is its velocity of impact? How high is the helicopter when the bagel hits the ground? |
| 49.2 m/s  808 m | 5. Colin Host is driving his Ferrari 345 m behind my Tercel. I am going 28.2 m/s, but Colin overtakes me in 16.43 seconds. How fast is the Ferrari going? How far does the Ferrari travel before it overtakes me? |
| 67.1 mph | 6. Bob White is 12.5 miles from home. If he drives the first 3.0 miles home at 35 mph, how fast does he need to drive the rest to average 55 mph |
| 5.94 s  60.7 m  -23.7 m/s | 7. Justin Case fires an air rocket upward at 34.5 m/s from ground level. Unfortunately (for him) the rocket lands on the top of a 32.0 m tall light tower on its way down. What time is the rocket in the air? How high does the rocket go? With what velocity does it strike the tower? |
| 7.17 s  1.52 s (going up)  5.66 s (going down) | 8. Molly Fayad pops a softball up that ends up being caught by the catcher at the same elevation as she hit it. A spectator, using a sextant, and a range finder, determines that the ball went 63.0 m into the air at its highest point. For what total time was the ball in the air? At what times is the ball at an elevation of 42.0 m? |
| 6.65 m/s  (6.52 is wrong) | 9. Austin Tascious sends a bowling ball down a 16.5 m long lane, and we hear the sound of impact 2.53 seconds later. If the speed of sound is 343 m/s, what speed did the bowling ball move? |
| 57.5 m | 10. Ali Katz is taking a dripping paint bucket back to the store, so he holds the paint bucket out the car's window, letting the paint drip onto the ground. The bucket is dripping at some unknown rate, and his car accelerates at some unknown rate, starting from rest. If the first drop drips when his car's velocity is zero, the second drop is 2.3 m down the road, how far is the sixth drop down the road? |