Kinematic Equations

1. Starting from rest, the Road Runner accelerates at 3m/s2 for ten seconds. What is the final velocity of the road runner?
2. Starting from rest, the Road Runner accelerates at 3 m/s2 for ten seconds. How far does the Road Runner travel during the ten second time interval?
3. A rocket starting from rest accelerates at 40,000 m/s2 down a 0.5m long chute. What is the velocity of the rocket as it leaves the chute?
4. A car traveling at 20m/s applies its brakes and comes to a stop in four seconds. What is the acceleration of the car?
5. A car traveling at 20m/s applies its brakes and comes to a stop in four seconds. How far does the car travel before coming to a stop?
6. The *USS Enterprise* accelerates from rest at 100,000 m/s2 for a time of four seconds. How far did the ship travel in that time?
7. At the scene of an accident, a police officer notices that the skid marks of a car are 10m long. The officer knows that the typical deceleration of this car when skidding is -45m/s2. What can the officer estimate for the original speed of the car?
8. A skier traveling at 5m/s accelerates down a hill at 1m/s2 for three seconds. What is the final velocity of the skier, and how far down the hill has the skier traveled in this time?
9. A train decreases speed from 30m/s to 20m/s while traveling a distance of 250m. What is the acceleration of the train?
10. A car travels at 25m/s to the north. It has an acceleration of 2m/s2 to the south for a duration of 20 seconds. What is the final velocity of the car?
11. A car travels at 25m/s to the north. It has an acceleration of 2m/s2 to the south for a duration of twenty seconds. What is the displacement of the car during this time?
12. Calvin tosses a water balloon to Hobbes. As Hobbes is about to catch it the balloon has a speed of 1m/s. Hobbes catches the balloon, and the balloon experiences an acceleration of -0.5m/s2 as it comes to rest. How far did Hobbes’ hands move back while catching the balloon?