1. Define acceleration. How do the units reflect this definition?

2. Describe a situation where an object can have:
   a. A constant speed but be experiencing a non-zero acceleration.
   b. An instantaneous velocity of zero but be accelerating.

3. A car accelerates from 25 m/s [E] to 5 m/s [W] in 35 seconds.
   a. Calculate the acceleration of the car. { $\vec{a}$ = –0.86 m/s^2}
   b. Calculate the displacement of the car during the above acceleration. {$\vec{d}_f$ = 348 m}

4. A person is standing atop a cliff that is 125 m high and drops a rock to the water below.
   a. Calculate the time it takes for the rock to hit the water below. {t = 5.04 s}
   b. Calculate the velocity as it enters the water. {$\vec{v}_f$ = –49.5 m/s}
   c. Calculate the velocity of the rock 65 m above the water. {$\vec{v}_f$ = –24.3 m/s}

5. Standing on the ground a person throws a ball. It leaves his hand with an upward velocity of 17 m/s.
   a. Calculate the length of time the ball will be traveling upwards. {t = 1.73 s}
   b. Calculate the ball's maximum height. {$\vec{d}_f$ = 14.7 m}
   c. Calculate the velocity of the ball when it is 5 m above the ground. {$\vec{v}_f = \pm$ 13.8 m/s}
   d. Calculate the position above the ground when the ball traveling at 4.5 m/s upwards. {$\vec{d}_f$ = 13.7 m}

6. A plane changed its velocity from 150 m/s [S] to 415 m/s [N]. The acceleration was a constant 15.0 m/s^2.
   a. Calculate the time it took for the plane to change its velocity. {t = 37.7 s}
   b. Calculate the time it took for the plane to return to its starting point. {t = 4.47 s}
   c. Calculate the displacement of the plane in that time. {$\vec{d}_f$ = 5000 m}
   d. Calculate the distance the plane traveled in that time. {d = 6500 m}