Acceleration: Taking into Account Direction

1. A car is initially driving 25 m/s up a large hill. On this hill it stalls and begins to coast. After 30 seconds its velocity is –13 m/s. Calculate the average acceleration acting on the car. (-1.27 m/s^2)

2. A glider is initially flying 62 m/s [N]. At head wind then blows and changes the gliders velocity to 45 m/s [S] in 65 seconds. Calculate the acceleration of the glider during that time. (-1.65 m/s^2 or 1.65 m/s^2 [S])

3. A ball is thrown straight up in the air. After 7.5 s the ball is on its way down and has a velocity of 14 m/s. Calculate the initial velocity of the ball. (+59.6 m/s or 59.6 m/s [up])

4. Calculate how long it takes for a car, undergoing an average acceleration of 5.6 m/s^2 [W], to change its velocity from 32 m/s [E] to 12 m/s [W]. (7.9 s)

5. A baseball is thrown with an initially velocity of 46 m/s [E]. After leaving the bat it is going 35 m/s [W]. Calculate the average acceleration of the ball if it was in contact with the bat for 0.34 seconds. (-240 m/s^2)

6. Standing atop a high building someone throws a coin straight up with an initial velocity of 26.5 m/s. Calculate is the coin's velocity after 1.5 seconds, 2.7 seconds, and 8.5 seconds. (11.8 m/s; 0.0 m/s; -57 m/s)

7. An electron is moving at 567 m/s [W] when a magnetic field is switch in. After 6.1 seconds the electron is now moving 241 m/s [W].
    a. Calculate the acceleration of the electron due to the magnetic field. (53 m/s^2 [E])
    b. If the acceleration stays constant, calculate the velocity of the electron after 22.6 seconds. (641 m/s [E])