

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/s²)
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/s² or 1.65 m/s² [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 speed 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/s² [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/s²)
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/s² [E])
 - b. If the acceleration stays constant, calculate the velocity of the electron after 22.6 seconds. (641 m/s [E])

