

Acceleration Practice Problems

$$a = \frac{v_f - v_i}{\Delta t}$$

1. A speedy rabbit is hopping to the right with a velocity of 4.0 m/s when it sees a carrot in the distance. The rabbit speeds up to its maximum velocity of 13 m/s with a constant acceleration of 2.0 m/s² rightward. How many seconds did it take the rabbit to speed up from 4.0 m/s to 13 m/s?
2. A sailboat is traveling to the right when a gust of wind causes the boat to accelerate leftward at 2.5 m/s² for 4 seconds. After the wind stops, the sailboat is traveling to the left with a velocity of 3.0 m/s. Assuming the acceleration from the wind is constant, what was the initial velocity of the sailboat before the gust of wind?
3. A racecar starts from rest and speeds up uniformly to the right until it reaches a maximum velocity of 60 m/s in 15 seconds. What is the acceleration of the racecar?
4. A canoe is drifting left toward a hungry hippo with a velocity of 7 m/s. The canoe rider starts paddling frantically, causing the canoe to travel to the right with a constant acceleration of 6.0 m/s². After 4 seconds, what is the velocity of the canoe?
5. A baseball is pitched at 40 m/s in a major league game. The batter hits the ball on a line drive straight toward the pitcher at 50 m/s. Determine the acceleration of the ball if it was in contact with the bat for 1/30 seconds.