

Constant acceleration word problems

1. A Thompson's gazelle can reach a speed of 13.0 m/s in 3.00s. A lion can reach a speed of 9.50 m/s in 1.00 s. A trout can reach a speed of 2.80 m/s in 0.120 s. Which animal has the greatest acceleration?
2. When striking, the pike, a predatory fish, can accelerate from rest to a speed of 4.0 m/s in 0.14s.
a) What is the acceleration of the pike during this strike? b) How far does the pike move during this strike?
3. A) What constant acceleration, in units of m/s^2 , must a car have to go from zero to 60 mph in 10 s? B) How far has the car traveled when it reaches 60 mph? Give your answer in units of meters and feet. [1 mile=5280 feet 1 inch=2.54 cm]
4. A jet plane is cruising at 250m/s when suddenly the pilot turns the engines up to full throttle. After traveling an additional 2.0s, the jet is moving with a speed of 300 m/s. What is the jet's acceleration, assuming it to be a constant acceleration?
5. A driver has a reaction time of 0.50 s, and the maximum negative acceleration of her car is 6.0m/s^2 . She is driving at 20 m/s when suddenly she sees an obstacle in the road 50 m in front of her. Can she stop the car in time to avoid a collision?
6. A light-rail train going from one station to the next on a straight section of track accelerates from rest at 1.4 m/s^2 for 15 s. It then proceeds at constant speed for 1100 m before slowing down at 2.2 m/s^2 until it stops at the station. What is the distance between the stations? How much time does it take the train to go between the stations?
7. One simple model for a person running the 100 m dash is to assume the sprinter runs with constant acceleration until reaching top speed, then maintains that speed through the finish line. If a sprinter reaches his top speed of 11.1 m/s in 2.14s, what will be his total time?
8. When you sneeze, the air in your lungs accelerates from rest to approximately 150 km/hr in about 0.55s. What is the acceleration of the air in m/s^2 ?