Using your book and others as guides, solve the following problems pertaining to acceleration, and graphs of velocity vs. time. This is NOT for points, but will help you to grasp the subject.

1) If my car starts moving forward at a time of zero on my stopwatch, and winds up 15.2 meters away at 1.81 seconds on my stopwatch, find an estimate for the average acceleration that it underwent in that amount of time.

2) If the velocity of a freely falling object (in meters per second) is given by the time-dependant equation, \( v = 22 - 9.8t \), then find the average acceleration between the time of 1.0 seconds and 3.1 seconds. What was the object’s initial velocity? When will the object have a velocity of 0 m/s?

3) The following is a graph of the velocity (m/s) vs. time (s) of a RC toy car’s motion.

A) Which interval(s) show(s) a constant velocity?

B) Which interval(s) have a positive acceleration? A negative acceleration?

C) Which interval(s) have the car moving forward?

4) A fighter pilot experiences blackout if the acceleration of his plane is greater than 7.1 g’s, where 1 g is the acceleration due to gravity at sea level (about 9.8 m/s\(^2\)). What speed would the pilot have to achieve from rest in 5.0 seconds in order to blackout? What is this speed in miles per hour? How does this compare to the velocity of a sound wave at room temperature and sea level (343 m/s)?

**BRAIN TEASER** – No Acceleration Involved
If you have two hourglasses, a four-minute and a seven-minute timer, how can you measure nine constant minutes exactly?