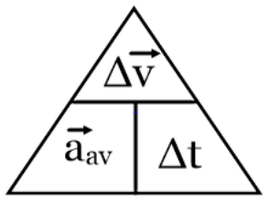
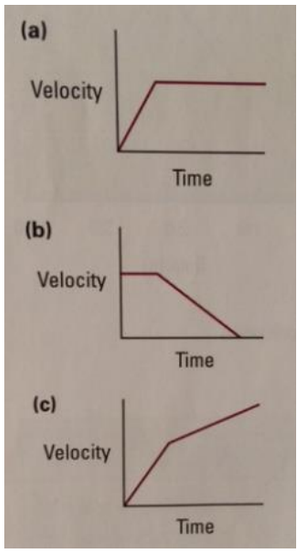
Acceleration Worksheet (Extra Practice)



1. Describe the motion illustrated in each velocity-time graph shown in the diagram to the right. Where possible, use terms such as uniform motion, uniform acceleration, and increasing or decreasing velocity. In (c), you can compare the magnitudes.



2. Calculate the unknown quantities in the table below

	Acceleration (m/s^2 [E])	Initial Velocity (m/s [E])	Final Velocity (m/s [E])	Time Interval (s)
a)	4.2	?	64	3.0
b)	0.35	15	18	?
c)	-0.18	24	?	5.2

3. One of the world's fastest rollercoasters has a velocity of 8.0 km/h [fwd] as it starts its descent on the first hill. Determine the coaster's maximum velocity at the base of the hill, assuming the average acceleration of 9.81 m/s^2 [fwd] lasts for 4.3 s.

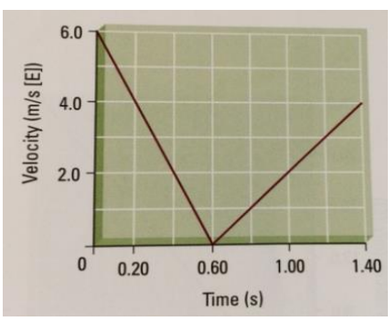
4. In the second stage of a rocket launch, the rocket's upward velocity increased from 1.0 x 10^3 m/s to 1.0 x 10^4 m/s, with an average acceleration of magnitude 31 m/s^2. How long did the acceleration last?

5. When a ball is thrown upward, it experiences a downward acceleration of magnitude 9.8 m/s^2, neglecting air resistance. With what velocity must a ball leave a thrower's hand in order to climb for 4.5 seconds before stopping?

6. If a car accelerates from rest at a constant 4.28 m/s^2, how long will be required to reach 22.8 m/s?

7. A car slows from 22 m/s to 3 m/s with a constant acceleration of -2.1 m/s^2. How long does it require to slow down?

8. Using the velocity time graph to the left, determine the following



   a. The velocity at 0.40 s and 0.80 s
   b. The average acceleration between 0.0 s and 0.60 s
   c. The average acceleration between 0.60 s and 1.40 s
   d. The average acceleration between 0.80 s and 1.20 s

9. Sketch a velocity-time graph for the motion of a car travelling south along a straight road with a posted speed limit of 60 km/h, except in a school zone where the speed limit is 40 km/h. The only traffic lights are found at either end of the school zone, and the car must stop at both sets of lights. (Assume that when t = 0.0 s, the velocity is 60 km/h [S].)