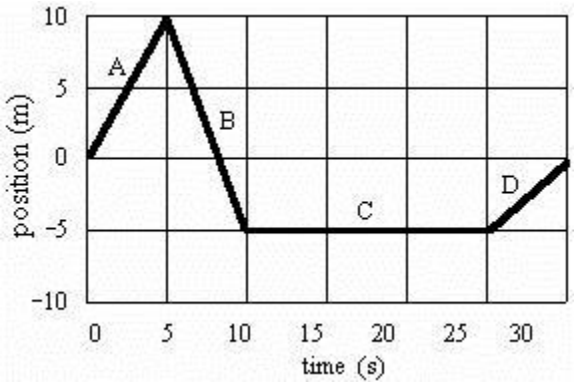
Chapter 9 Practice Problems (and some chapter 8 too)

1. (Chapter 8 Problem)
   What is the average velocity of this object during the time interval of 5s – 10s?



2. You are riding your bicycle travelling forward at 6 m/s. You need to get somewhere in a hurry, so you increase your velocity to 11 m/s forward.
   a) What is your change in velocity?

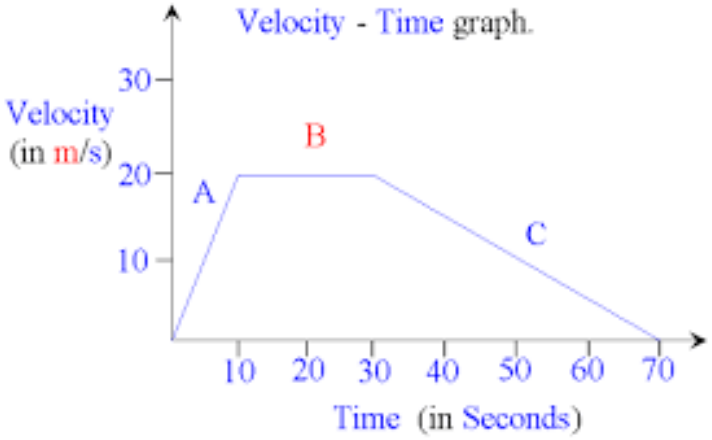
   b) It took you 2 seconds to increase your velocity from 6 m/s forward to 11 m/s forward. What was your acceleration?

3. A truck goes through a special traffic zone (8.33 m/s speed limit) with a forward velocity of 60 km/h. A police officer records the speed. Should the officer give the truck driver a speeding ticket? (How fast was the driver going in m/s? OR what is the speed limit in km/h?)

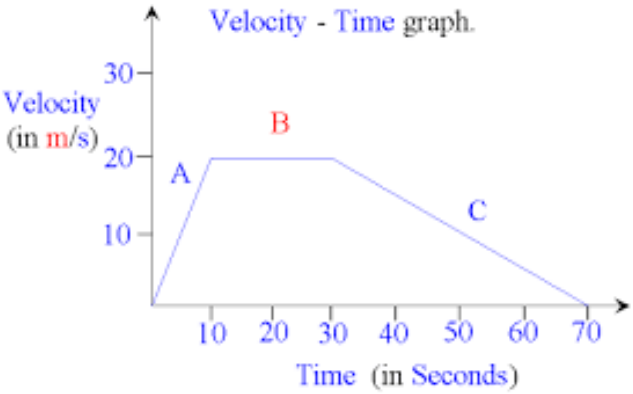
4. Your older brother is driving the family car forward through a school zone at an unreasonable 18 m/s. He slams on the brakes and brings the car to rest in 1.5 seconds. What was the acceleration of the car? (Remember that acceleration is a vector!)

5. What is the average acceleration of this object between:

   a) 0s – 10s?
   b) 10s – 30s?
   c) 30s – 70s?



6. At what time(s) is this object not moving?



7. A motorcycle is travelling north at 11 m/s. How much time would it take for the motorcycle to increase its velocity up to 26 m/s [N] if it accelerated at 3.0 m/s^2?

8. A skier moving 6.0 m/s forward begins to slow down, accelerating at -2.0 m/s^2 for 1.5s, What is the skier's velocity at the end of the 1.5s?

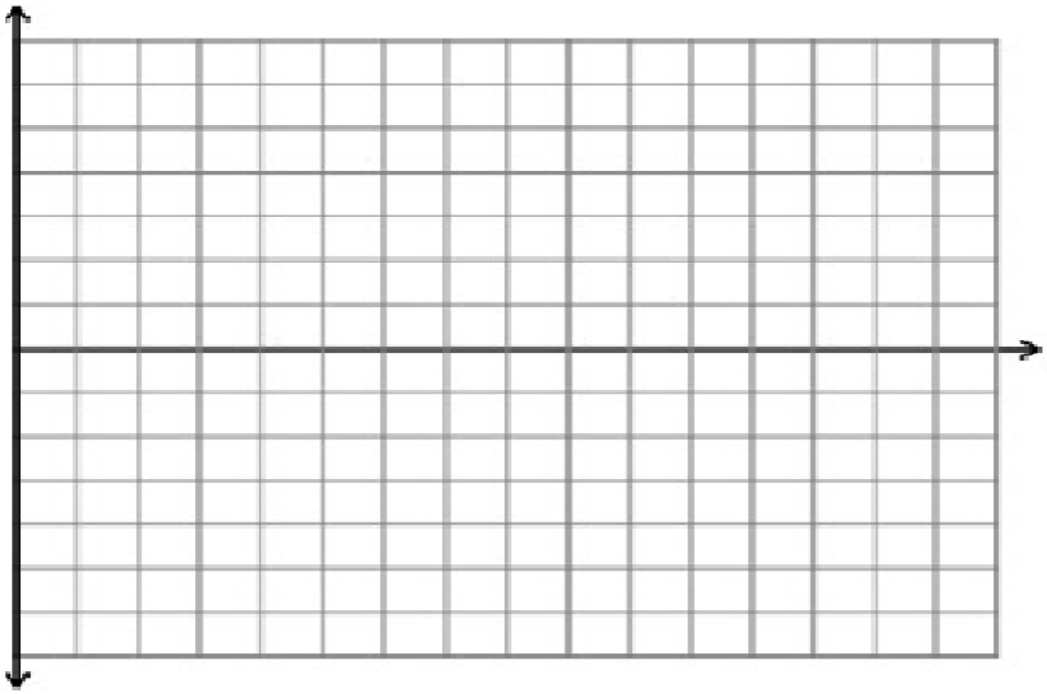
9. A ball is launched in the air. How much time does it take to go from 30 m/s up to 10.4 m/s up?

10. A) A burning couch is thrown down from the top of a very tall building with a downward velocity of 11 m/s. What is the velocity of the couch after 5 s?

B) Take your answer from part A) and convert it into km/h.

11. A small lapdog, scared by a squirrel, changes its velocity from 6.0 m/s forward to 4.0 m/s backward in 2.0s. What is the acceleration of the dog?

12. Draw a velocity time graph and draw **four labelled lines** on it to describe the following situations:
    a) A car starting from rest, then accelerating to the right.
    b) A car starting from rest, then accelerating quickly to the right, then traveling with uniform motion to the right.
    c) A car traveling to the left with uniform motion, then slowing down and stopping.
    d) A car is traveling to the right and slowing down until it stops. It stays stopped for a few moments then accelerates backwards (left), drives backwards (left) with uniform motion, then stops.



Answers:

1. -3m/s
2. A) 5 m/s forward
   B) 2.5 m/s^2 forward
3. Yes, give a ticket. Speed Limit = 30 km/h (29.99) OR Driving at 16.7 m/s
4. -12 m/s^2 (12 m/s^2 backwards)
5. A) +2 m/s^2
   B) 0 m/s^2
   C) -0.5 m/s^2
6. t=0s and t = 70s
7. 5.0s
8. 3.0 m/s forward
9. 2s
10. A) 60m/s down (-60m/s)
    B) 216 km/h down (-216 km/h)
11. -5 m/s^2 (5m/s^2 backwards)
12.