2.1 How do we measure speed?

1. The speedometer in my car is broken. In order to find my average velocity on a trip from Helena to Missoula, I need
   i. the distance between Helena and Missoula
   ii. the time spent traveling
   iii. the number of stops I made during the trip
   iv. a friend with a stopwatch
   v. a working odometer
   vi. none of the above

Select the best combination:

(a) i, ii, & iii only
(b) i & ii only
(c) iv & v only
(d) vi
(e) a combination that is not listed here

2. The speedometer in my car is broken. In order to find my velocity at the instant I hit a speed trap, I need
   i. the distance between Helena and Missoula
   ii. the time spent traveling
   iii. the number of stops I made during the trip
   iv. a friend with a stopwatch
   v. a working odometer
   vi. none of the above

Select the best combination:

(a) i, ii, & iii only
(b) i & ii only
(c) iv & v only
(d) vi
(e) a combination that is not listed here

3. Which graph represents an object slowing down, where $D$ is distance, and $t$ is time? Assume that the units are the same for all graphs.

4. True or False: If a car is going 50 miles per hour at 2 pm and 60 miles per hour at 3 pm, then it travels between 50 and 60 miles during the hour between 2 pm and 3 pm.
   (a) True, and I am very confident
   (b) True, but I am not very confident
   (c) False, but I am not very confident
   (d) False, and I am very confident

5. True or False: If a car travels 80 miles between 2 and 4 pm, then its velocity is close to 40 mph at 2 pm.
   (a) True, and I am very confident
   (b) True, but I am not very confident
   (c) False, but I am not very confident
6. **True or False:** If the time interval is short enough, then the average velocity of a car over the time interval and the instantaneous velocity at a time in the interval can be expected to be close.

   (a) True, and I am very confident
   (b) True, but I am not very confident
   (c) False, but I am not very confident
   (d) False, and I am very confident

7. **True or False:** If an object moves with the same average velocity over every time interval, then its average velocity equals its instantaneous velocity at any time.

   (a) True, and I am very confident
   (b) True, but I am not very confident
   (c) False, but I am not very confident
   (d) False, and I am very confident