Friday, October 19/12
Science 10

Announcements

1. HW: Understanding Concepts: **Page 388, #3-5, 7, 9, 10-13**

   To be passed in Monday - do on looseleaf.

   *Page 388, #6, 8 - Optional

2. Speed-Time Graphs for Acceleration (Page 390-392)

Understanding Concepts

1. In uniform or constant speed, the speed is the same during each time interval. In constant acceleration, what is the same in each time interval?
2. You and your friend are on your bicycles and accelerate from rest. If your average acceleration is double that of your friend, how will your change in speed compare with your friend's after the same time interval?
3. In a road test, car A accelerates from rest (0 km/h) to 100.0 km/h in 16.0 s and car B takes 8.0 s in the same test. Which car has the greater average acceleration? By how many times?
4. A cyclist increases her speed by 5.0 m/s in a time of 4.5 s. What is her acceleration?
5. A roller coaster car accelerates at 8.0 m/s^2 for 4.0 s. What is the change in the speed of the roller coaster car?
6. The human heart pumps about 60 mL of blood into the aorta during a single stroke, which lasts about 0.1 s. In a single stroke, a pulse of blood is accelerated from rest to about 50 cm/s. Calculate the average acceleration of the blood in metres per second squared.
7. A downhill skier moving at 2.5 m/s accelerates to 20.0 m/s in a time of 3.8 s.
   (a) Calculate the average acceleration of the skier.
   (b) What does this acceleration mean?
8. An electric car accelerates from rest to 50.0 km/h in 8.20 s.
   (a) What is the average acceleration of the electric car in kilometres per hour per second?
   (b) Assuming constant acceleration, what time would the car take to accelerate from 40 km/h to 60 km/h?

Figure 7

9. A baseball player running at 6.0 m/s slides into home plate and stops in 2.5 s (**Figure 7**). What is the average acceleration of the baseball player?

Questions 10–14 require you to rearrange the acceleration equation.

10. You are coasting on your skateboard at 1.4 m/s and you decide to speed up. If you accelerate at 0.50 m/s^2 for 7.0 s, what is your final speed?

11. A train is moving at 5.0 km/h and accelerates at 95 km/h^2 for 0.50 h. What is the final speed at the end of the 0.50 h?

12. A car travelling at a constant speed approaches the top of a hill. The car rolls down the hill at an acceleration of 2.0 m/s^2 for 8.0 s and reaches a final speed of 26 m/s. What was the initial speed of the car before accelerating down the hill?

13. An octopus can accelerate rapidly by squirting a stream of water for propulsion. An octopus moving at 0.10 m/s accelerates at 5.5 m/s^2 to a final speed of 3.5 m/s. What is the elapsed time during the acceleration?

14. The NASA space shuttle touches down on a runway at an initial speed of 95 m/s and accelerates at a rate of –4.40 m/s^2 (**Figure 8**). How much time does it take for the shuttle to stop?

#3. CAR A $6.25 \frac{km/h}{s}$

CAR B $13 \frac{km/h}{s}$

#4. $1.1 \frac{m}{s^2}$

#5. $32 \frac{m}{s^2}$

#7. a) $4.6 \frac{m}{s^2}$

* b) $\frac{4.6 \frac{m}{s}}{s}$

#9. $-2.4 \, m/s^2$

slowed down

#10. $4.9 m/s$

#11. $53 \frac{km}{h}$

#12. $\frac{10m}{s}$

#13. $0.62 \, s$