AP Physics – Love That Homework – 1 ans

1. Give an example of two cars that have the same speed but different velocities.
2. You are driving down the road at a constant velocity. What are 3 ways you could safely change your velocity?
3. You nose out another runner to win the 100.000 m dash. If your total time for the race was 11.800 s and you aced out the other runner by 0.001 s, by how many meters did you win?

$$v = \frac{x}{t} = \frac{100.00\ m}{11.8\ s} = 8.4746\frac{m}{s} \qquad v = \frac{x}{t} \quad x = vt \quad = 8.4746\frac{m}{\cancel{s}}(0.001\ \cancel{s}) = \boxed{0.008\ m}$$

4. The speed of sound is 344 m/s. You see a flash of lightning and then hear the thunder 1.5 seconds later. How far away from the lightning strike are you?

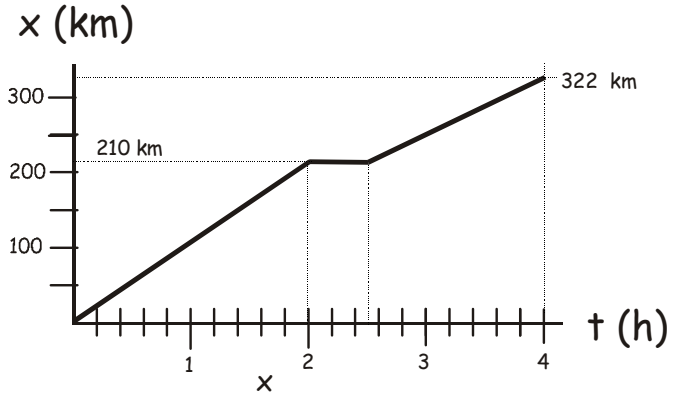
$$v = \frac{x}{t} \quad x = vt \quad = 344\frac{m}{\cancel{s}}(1.5\ \cancel{s}) = \boxed{520\ m}$$

5. A train travels from Denver to Bougainvillea in 5 hours and 37 minutes. If the average speed for the train was 76.5 km/h, how much distance did it cover?

$$t = 5\ h + 37\ \cancel{\text{min}}\left(\frac{1\ h}{60\ \cancel{\text{min}}}\right) = 5.617\ h \qquad v = \frac{x}{t} \quad x = vt \quad = 76.5\frac{km}{\cancel{h}}(5.617\ \cancel{h}) = \boxed{430.\ km}$$

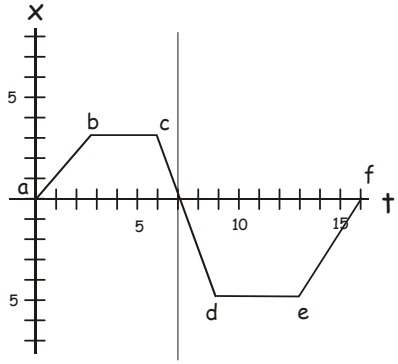
6. You travel down the highway, starting from rest. You travel for 2.0 h at a speed of 105 km/h. Then you stop and eat your lunch for 30.0 min. Then you travel for 1.5 h at 75 km h. Make a distance vs time graph of this motion.

$$210\ km + (1.5\ \cancel{h})\left(75\frac{km}{\cancel{h}}\right) = 322.5\ km$$



7. A car travels along a straight section of road. A distance vs time graph illustrating its motion is graphed to the right.

(a) Indicate every time ***t*** for which the cart is at rest.
(b) Indicate every time interval for which the speed of the cart is increasing.
(c) What is the velocity from: a – b, b – c. c - d, d – e, and e – f?



Position Time Graph

(a) at rest: b-c, d-e so 3-6 s and 9-13 s
(b) Speed increases at c, time of 7 s. also increases at e, time of 14 s.

(c) a – b: $v = \frac{3\ m}{3\ s} = \boxed{1\frac{m}{s}}$

b – c: $v = \boxed{0\frac{m}{s}}$

c – d: $v = \frac{-5\ m - (3\ m)}{9\ s - 6\ s} = \boxed{-2.7\frac{m}{s}}$

d – e: $v = \boxed{0\frac{m}{s}}$

e – f: $v = \frac{0\ m - (-5\ m)}{16\ s - 13\ s} = \boxed{1.7\frac{m}{s}}$