Mathematics 122

Quiz # 4 Name: Key

You must show your work to get full credit.

1. A car covers 55 miles in a one hour trip. The distance, s, covered at intermediate times are given in the following table:

t (hours)	0.00	0.25	0.50	0.75	1.00
s (miles)	0	10	25	45	55

(a) What is the average speed for the entire trip. Give units on the answer.

$\frac{\Delta s}{\Delta t} = \frac{55-0}{1.00-0.00} = 55$ Average speed is 55 miles/hour

(b) What is the average speed during the first half of the trip:

$\frac{\Delta s}{\Delta t} = \frac{25-0}{.50-.00} = \frac{25}{.5} = 50$ Average speed is 50 miles/hour

2. The following shows the numbers of gallons, V, of water in a fish tank t minutes after the faucet filling it is turned on.

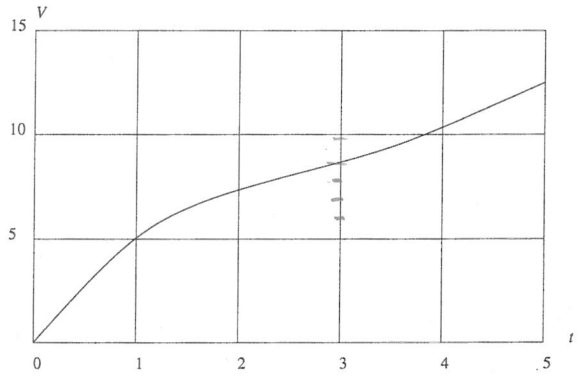

FIGURE 1

What is the average rate that water is flowing into the tank between $t = 1$ and $t = 3$ minutes? Be sure to give the units.

$\frac{\Delta V}{\Delta t} = \frac{V(3)-V(1)}{3-1} = \frac{9-5}{2} = \frac{4}{2} = 2$ Average flow rate is: 2 gallons/min

3. Let the distance traveled by a particle after t seconds be $s(t) = 2t^2 + +t$ meters.

(a) What is the average speed between $t = 2$ and $t = 2.1$ seconds? 9.2 m/sec

$\frac{\Delta s}{\Delta t} = \frac{s(2.1)-s(2)}{2.1-2} = \frac{2(2.1)^2+2.1-2\cdot 2^2-2}{.1} = 9.2$

(b) What is the average speed between $t = 2$ and $t = 2.01$ seconds? 9.02 m/sec

$\frac{\Delta s}{\Delta t} = \frac{s(2.01)-s(2)}{2.01-2} = \frac{2\cdot(2.01)^2+2.01-2(2)^2-2}{.01} = 9.02$