Mathematics 122

Quiz 2 Name: Key

You must show your work to get full credit.

1. The following table shows attendance at NFL football games.

Year	2011	2012	2013	2014	2015
Attendance (in millions)	17.12	17.18	17.30	17.36	17.26

(a) Find the average rate of change in the attendance from 2011 to 2015. Give units.

Average rate is: .035 million/year

$$\frac{\Delta \text{Attendance}}{\Delta \text{Year}} = \frac{17.26 - 17.12}{2015 - 2011} = \frac{0.14}{4} = .035$$

(b) Find the annual increase in the average attendance for each year from 2011 to 2015. Your answer should be four numbers.

2011 to 2012 $17.18 - 17.12 = .06$ 2012 to 2013 $17.30 - 17.18 = .12$

2013 to 2014 $17.36 - 17.30 = .06$ 2014 to 2015 $17.26 - 17.36 = -.10$

The units on those are millions/year

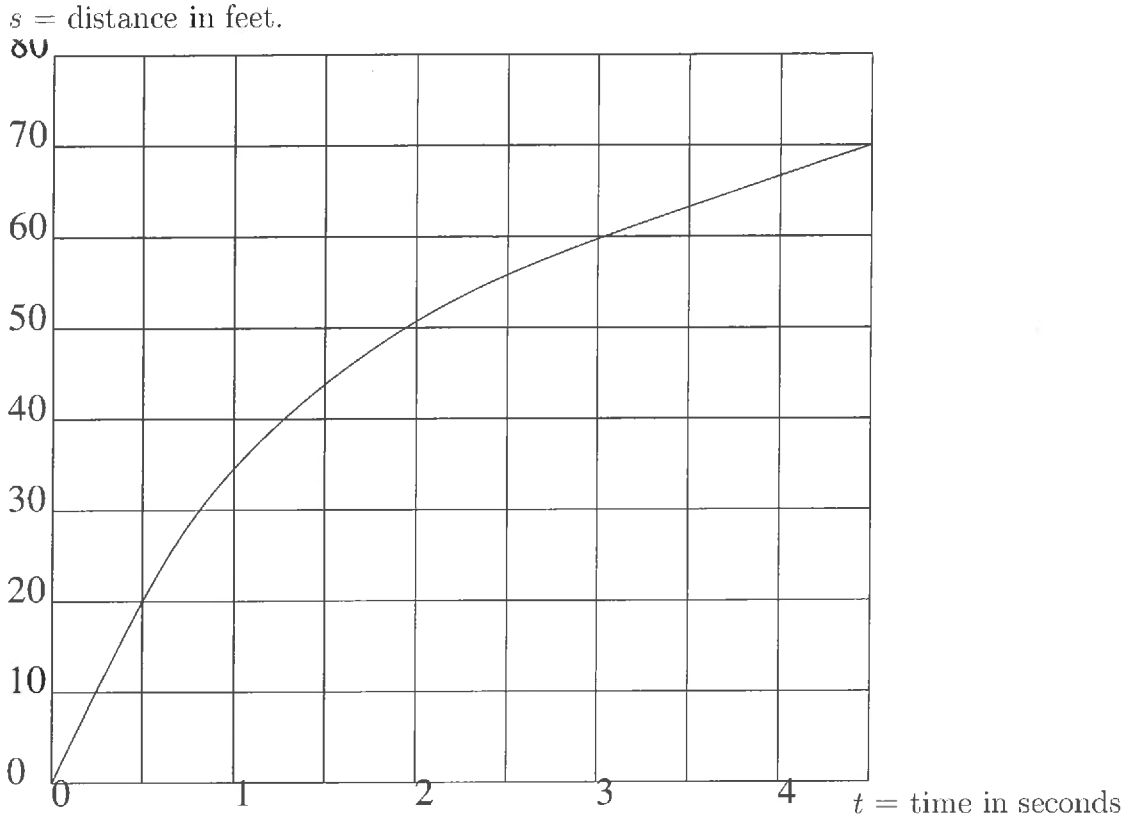
(c) Show that the average rate of change found in part (a) is the average of the four yearly changes in part (b).

The average of the numbers in (b) is

$$\frac{.06 + .12 + .06 - .10}{4} = \frac{0.14}{4} = .035$$

Which is the same as the answer in part (a).

2. The following graph shows the distance, s, in feet a car has traveled t seconds after the brakes are applied.



(a) What is the average speed of the car between $t = .5$ and $t = 3$? Include units in your answer.

The average speed is 16 feet/sec.

$$\frac{\Delta s}{\Delta t} = \frac{60-20}{3.0-.5} = \frac{40}{2.5} = 16$$

(b) What is the average speed between $t = 2$ and $t = 4.5$ seconds?

The average speed is 7.6 feet/sec.

$$\frac{\Delta s}{\Delta t} = \frac{70-51}{4.5-2} = \frac{19}{2.5} = 7.6$$