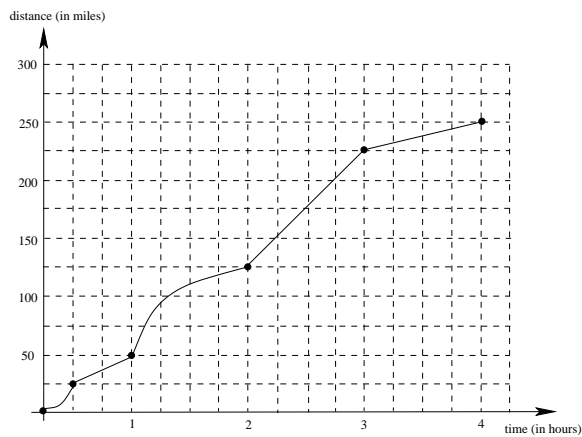Math 261
Introduction to Chapter 2
08/28/2014

The following graph gives the distance of a car driving from Moorhead, MN toward Glen Ullin, ND as a function of time.

distance (in miles)

1. How far away from Moorhead is the car after 1 hour? 2 hours? 4 hours?

2. What was the average speed of the car over the entire 4 hour drive?

3. What was the average speed of the car during the first two hours of the trip?

4. What was the average speed of the car during the last hour of the trip?

5. When, during the trip was the car going the fastest?

In general, the **average rate of change** of a function $y = f(x)$ with respect to x over an interval $[x_1, x_2]$ is given by $\dfrac{\Delta y}{\Delta x} = \dfrac{f(x_2) - f(x_1)}{x_2 - x_1} = \dfrac{f(x_1 + h) - f(x_1)}{h}$, $h \neq 0$, where $h = x_2 - x_1$ in the final expression.

Example 2: Suppose a model rocket is launched from the ground. Its height in meters as a function of time in seconds is given by the function $y = g(t) = 40t - 10t^2$

1. In the space provided, graph the function $g(t)$.

2. When does the rocket hit the ground?

3. What is the maximum height reached by the rocket?

4. What is the initial launch speed of the rocket?