LAS Calculus
Average Rates of Change
Homework 1

1. Find the average rate of change of $y = f(x) = 2x^2$ from $x = 1$ to $x = 3$.

2. Find the average rate of change of $y = f(x) = \sqrt{x}$ from $x = 1$ to $x = 9$.

3. To buy x pounds of new, improved, Stuff, it costs $f(x) = 3\sqrt{x}$ dollars. What is the average rate of change of the price (with respect to the number of pounds bought) from $x = 1$ pound to $x = 4$ pounds?

4. An object is traveling so that in t minutes, its position will be $f(t) = 2t^2 - 4t + 3$ feet away. What is the average velocity of the object from $t = 2$ to $t = 5$ minutes?

5. A car is traveling away so that in t hours, it will be $f(t) = 45 + 2t^2$ miles away. What is the average velocity of the car from now ($t = 0$) to $t = 2$ hours?

6. An object is travelling so that in t minutes, it's position will be $f(t) = 2t^2 - 4t + 3$ feet away. What is the average velocity of the object from $t = 2$ to $t = 5$ minutes?

   item To buy x pounds of new, improved Stuff, it costs $f(x) = 3\sqrt{x}$ dollars. What is the average rate of change of the price (with respect to the number of pounds bought) from $x = 1$ pound to $x = 4$ pounds?

7. As x increases from 3 to 7, the average rate of change of y with respect to x is 5. How much does y increase? (In other words, what is Δy?)

8. As x increases from 2 to 5, the average rate of change of $y = f(x)$ with respect to x is 3.

   (a) What is Δy?

   (b) If $f(2) = 7$, what is $f(5)$?

9. From time 2 hours from now until 4 hours from now, a car's average velocity is 45 miles per hour.

(a) How far does the car travel during this time?

(b) If the car is 100 miles away in 2 hours, how far away is it in 4 hours?