Math 190 Lab 5: Oct 11 and 13

Work through the following problems while the instructor and TA circulate. When you have completed the problems (to the satisfactory of the facilitators) you can spend the rest of the lab working on the weeks homework.

Warm up:
Recall the definition of the derivative:

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}.$$

Explain (using a picture) why this expression should give you the slope of the tangent line to $f(x)$ at the point $(x, f(x))$.

Questions:

1. Use the definition of the derivative above (not any other method) to find the derivative of:
   (a) $f(x) = \sqrt{x}$
   (b) $f(x) = \dfrac{1}{x}$

2. Recall the formula for the equation of a line in slope-point form.
   (a) Using your answer from problem 1 find the equation of the tangent line to $\sqrt{x}$ at the point $(16, 4)$.
   (b) Using your answer from problem 1 find the equation of the tangent line to $1/x$ at the point $(2, 1/2)$.