Name _____

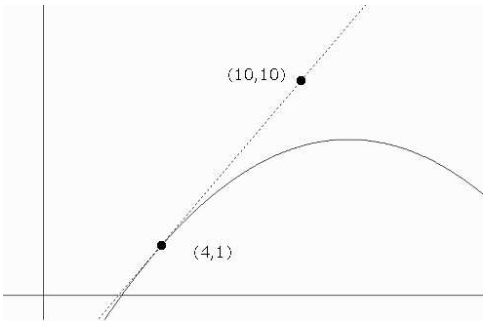
Homework 9
section 2.1 & 2.2

1. (4) Use algebra to evaluate $\lim_{h \to 0} \dfrac{(2+h)^3 - 8}{h}$.

2. (4) Let $f(x) = x^2 + 2x$. Find a constant c so that $\lim_{h \to 0} \dfrac{f(3+h) - c}{h}$ exists.

3. (6) Find the equation of the line tangent to $f(x) = \sqrt{x}$ at the point $x = 4$. (Big hint: After you have correctly set up the limit, it may be helpful to multiply both the numerator and denominator by $\sqrt{4+h}+2$)

4. (4) The following picture depicts a function $g(x)$ and its tangent line at a point. Use the picture to fill in the blanks. (Warning: Picture not drawn to scale)



$g(\_\_\_\_) = \_\_\_\_$ $\qquad\qquad$ $g'(\_\_\_\_) = \_\_\_\_$

5. (2) Suppose that $f(x)$ is a function with $f(47) = 19$ and $f'(47) = \frac{5}{2}$. Estimate $f(51)$.