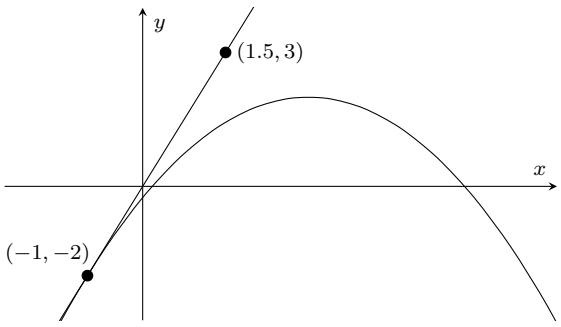
Name _____

Homework 2
Sections 2.1 & 2.2

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

2. (4) The following figure depicts a function $g(x)$ and its tangent line at a point. Use the figure to fill in the blanks.



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

3. (7) Find the slope of the line tangent to $f(x) = \sqrt{x}$ at the point $x = 9$. (Big hint: After you have correctly set up the limit, it may be helpful to multiply both the numerator and denominator by $\sqrt{9+h}+3$)

4. (3) Suppose that $f(x)$ is a function with $f(43) = -6$ and $f'(43) = \frac{5}{2}$. Estimate $f(49)$.