

For the first two problems, consider the graph to the right.

1. (2 points) Suppose that the graph shows a function $f(x)$ and a line tangent to the curve $y = f(x)$ (the solid line). If the equation of the line is $y = 3 - x$, fill in the following blanks:

$$f(\underline{\hspace{1cm}}) = \underline{\hspace{1cm}}$$

$$f'(\underline{\hspace{1cm}}) = \underline{\hspace{1cm}}$$

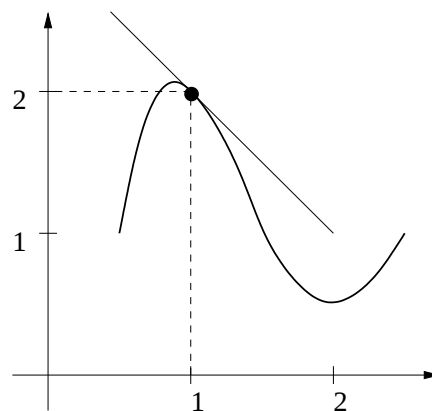
2. (4 points) Now suppose that the curve graphed is $g'(x)$ for some function g . The indicated line is still $y = 3 - x$, and is tangent to the graph of $y = g'(x)$. Assume that $g(x)$ and its derivatives are defined only for $\frac{1}{2} \leq x \leq 2\frac{1}{2}$. Where (for what x -value) is

$g(x)$ smallest?
 $g(x)$ largest?

$g'(x)$ smallest?
 $g'(x)$ largest?

$g''(x)$ smallest?
 $g''(x)$ largest?

Are the largest values of $g'(x)$ and $g''(x)$ greater than 1? Greater than 2? Greater than 3? (How do you know?)



3. (4 points) A Purple-Headed Uniquely Nocturnal Chartreuse And Luridly Colored wombat is sighted moving across the diag. Its position, measured in feet from the West Engineering arch, is given as a function of time (in minutes past midnight) in the following table.

t	0	5	10	15	20	25	30
position	0	7	15	27	30	31	218

- Estimate the wombat's velocity at $t = 0$, $t = 5$, $t = 10$ and $t = 15$.
- Estimate the wombat's acceleration at $t = 5$ and $t = 10$.
- What do you think happened between $t = 25$ and $t = 30$?