5.1-What Does $f'$ say about $f$?

Read Section 5.1 in the text and complete the following on your own:

- If $f'(x) > 0$ for all $x \in (a, b)$, then $f$ is **increasing on** $(a, b)$

- If $f'(x) < 0$ for all $x \in (a, b)$, then $f$ is **decreasing on** $(a, b)$

- Concavity: $f''(x) > 0$ (up)
- Concave up on $(a, b)$ ($f''(x) > 0$)
- Concave down on $(a, b)$ ($f''(x) < 0$)

**Example:**

Sketch the graph of a function whose slope is always negative and increasing.

$\text{ONE EXAMPLE}$

$f(x) = e^{-x}$

- **$f'(x) = -e^{-x}$ always neg**
- **$f''(x) = e^{-x}$ always pos**
- So $f'$ inc
Sketch the graph of a function which satisfies the following:

\[ f(2) = 1 \quad (2,1) \]
\[ f'(x) < 0 \text{ for } x < 2 \]
\[ f'(x) > 0 \text{ for } x > 2 \]
\[ f''(x) < 0 \text{ for all } x \]

Basic idea:

\[ ++ \quad \text{or} \quad \text{or} \]
\[ + \quad - \\ \text{or} \quad \text{or} \]
Give the x-coordinate(s) of all inflection point(s) of $f$. 

max/min of $f'$ (change from inc to dec or dec to inc)

The numbers appearing in your answers must be chosen from the following list:

-10.00, -3.01, -1.32, .46, 2.04, 2.98, 3.95, 5.04, 6.59, 8.01, 10.00

Enter Your Answer:

Learn to identify the properties of a function, its derivative and its second derivative from the graph of the second derivative.
This is the graph of the derivative of f. Questions will appear in a separate window.

Which of these graphs is f? Click below the Plot.

- Plot #1
- Plot #2
- Plot #3
This is the graph of the derivative of $f$. Questions will appear in a separate window.

To get started, click on Ask Question (below).

Which of these graphs is $f''$? Click below the Plot.
This is the graph of the derivative of \( f \). Questions will appear in a separate window.

To get started, click on Ask Question (below).

Which of these graphs is \( f'' \)? Click below the Plot.