❖ Definition of Derivative

➢ The derivative of a function f is the function f' whose value at x is:

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

(if the limit exists)

❖ How to Find a Derivative

➢ The algebraic steps we use to calculate $f'(x)$ directly from the definition are always the same:

1. Write out $f(x)$ and $f(x+h)$.
2. Subtract $f(x)$ from $f(x+h)$.
3. Divide by h.
4. Take the limit as $h \to 0$.

Examples:

Use the definition of derivative to find $f'(x)$ for the given function.

1. $f(x) = 2x^2 - 5$

2. $f(x) = \sqrt{x+1}$

3. $f(x) = \dfrac{x}{x+1}$

Assignment: page 124, #s 6, 8, 14, 18 & 20

Only do the first part of the directions: use the definition of derivative to find $f'(x)$ of the given function.