On these problems you will use the **limit definition of the derivative**,

$f'(x)=\lim_{h\to 0}\dfrac{f(x+h)-f(x)}{h}$, to compute each of the following derivatives.

For each function do the following steps:

(a) Find the difference quotient $\dfrac{f(x+h)-f(x)}{h}$

(b) Simplify your answer to part (a) using algebra

(c) Take the limit as $h\to 0$ to compute $f'(x)$.

1. $f(x)=x^2+5x$
2. $f(x)=\sqrt{x+5}$
3. $f(x)=\dfrac{1}{x+3}$
4. $f(x)=\sqrt{3x-2}$
5. $f(x)=\dfrac{7}{x-4}$