The Definition of a Derivative: The derivative of $f(x)$ at $x = a$, is defined as

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

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For each: Use the limit definition of the derivative, and make sure to add parenthesis when needed!

1. Let $R(q) = q^2 - 3q$. Find $R'(7)$

2. Verify that $\frac{d}{dx}\left[\sqrt{x} + 1\right]_{x=9} = \frac{1}{6}$

Use the limit definition of the derivative to determine if $f(x) = \begin{cases} x - 1 & x \geq 0 \\ x + 1 & x < 0 \end{cases}$ is differentiable at $x = 0$ (Hint: You will need one-sided limits)

3. Using the power rule ($\frac{d}{dx}[x^n] = nx^{n-1}$) to compute $\frac{d}{dx}\left[\sqrt[5]{x^3}\right] =$

4. Using the power rule ($\frac{d}{dx}[x^n] = nx^{n-1}$) to compute $\frac{d}{dx}\left[\frac{1}{\sqrt[3]{x}}\right] =$