

Nearly all men can stand adversity, but if you want to test a man's character, give him power. - Abraham Lincoln

Use the Power Rule to find the **derivative** of each function.

1) $y = x^5$	2) $f(x) = 4x^3$	3) $f(x) = 3x^2 - 4x + 1$
4) $y = 5x - 1$	5) $f(t) = -2t^2 + 3t - 6$	6) $f(x) = \frac{1}{x^7}$
7) $f(x) = 2x^{-1} + 5x^2$	8) $f(x) = \sqrt[4]{x}$	9) $y = \sqrt[3]{x^2}$

Find the **instantaneous rate of change** of each function when $x = 1$.

10) $y = \frac{1}{3}x^{-3}$	11) $f(x) = 8$	12) $y = 4x^{-2} - 8x + 1$
13) $f(x) = \frac{x^{-4}}{4} - \frac{x^{-3}}{3} + \frac{x^{-2}}{2} - x^{-1} + 3$	14) $y = 2\sqrt{x} - \frac{1}{\sqrt{x}}$	15) $f(x) = x^{4/5} + x^{2/3} - 3$

Find the **slope of the curves** at the indicated values of x .

16) $y = x^4 - 3x^2 + 2, \quad x = 2$	17) $f(x) = x^3 + x, \quad x = -1$
18) $f(x) = \frac{2}{\sqrt[4]{x^3}}, \quad x = 1$	19) $y = (x^2 + 2x)(x + 1), \quad x = 0$

20. Evaluate $\lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 - 5(x + \Delta x) + 6 - (x^2 - 5x + 6)}{\Delta x}$ using the **power rule**.

21. Find two unique functions, $f(x)$, such that $f'(x) = x^2 + 2x + 8$. (Answers will vary)