

Problem Solving

Classes that involve problem solving (e.g. statistics, chemistry, dynamics, etc.) require practice, practice, practice! The repetition allows you to recognize types of problems and patterns for solving them. However, just doing the steps over and over will not suffice when it comes to preparing for a test. It is important to learn the concepts, theories, and formulas behind each step. Therefore, consider using a chart like the one listed below when practicing problems. Such a system will allow you to discover patterns, understand the process and identify where you are getting stuck.

Example Calculus Problem

Solve: $(d/dx) 5x^2 - 2x + 3$

What is given?	What do you need?	What formulas will you need?	Work it out – step by step!	Explain each step (rules applied)
$f(x) = 5x^2 - 2x + 3$	We need to find the derivative of $f(x)$	$(d/dx) a*x^n = n*a*x^{(n-1)}$ and $(d/dx) c = 0$ where c is a constant	$f(x) = 5x^2 - 2x + 3$ $(d/dx) f(x) = (d/dx)(5x^2 - 2x + 3)$ $= (d/dx)[5x^2] + (d/dx)[-2x] + (d/dx)[3]$ $(d/dx) f(x) = [10x] + [-2] + [0]$ $(d/dx) f(x) = 10x - 2$	1. Write the initial formula 2. Apply the derivative operator to both sides of the equation 3. Apply the formula for the derivative of a polynomial term. That is, for $5x^2$: $a = 5$, $n = 2$ which after plugging these values into our equation yields: $2*5*x^{(2-1)}$ which equals $10*x$ Similarly, $(d/dx) -2x = -2$, and $(d/dx) 3 = 0$, by our last formula. Hence, we have $f(x) = 10x - 2$

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