

Thoughtful Thinking #1 - The Power Rule

You recently learned the power rule for differentiation. You learned that you can, relatively easily, take the derivative of something like this...

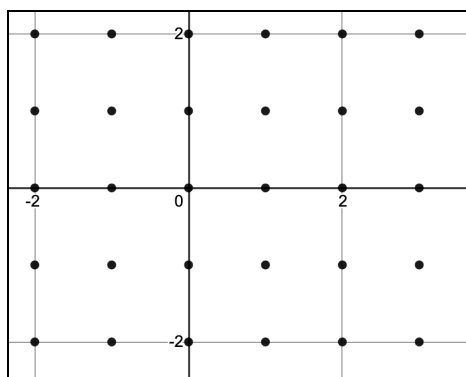
$$y = 7x^4 - x^3 + 4x - 1$$

And get this...

$$dy/dx = \underline{\hspace{2cm}}$$

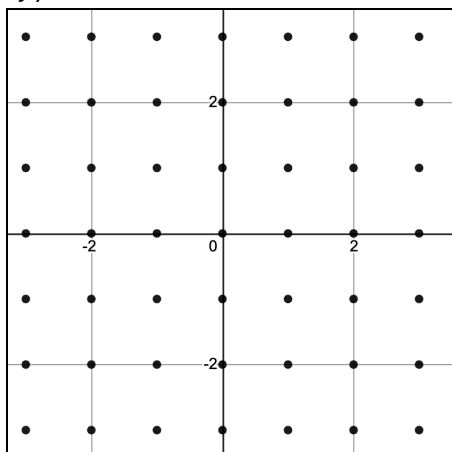
1.) If you think of dy/dx as a function, what are the inputs? What are the outputs?

2.) Consider the slope equation $dy/dx = x - 1$. Let's graph this below. Only plot on the points with dots.



3.) Try to find the function whose derivative is $dy/dx = x - 1$.

4.) Let's try graphing another slope equation. Try $dy/dx = x^{-1}$



5.) Try to find the function whose derivative is $dy/dx = x^{-1}$. Can this be found easily using the rule for anti-deriving a power rule? Why or why not? (Hint: think about another type of function that has a vertical asymptote at $x = 0$.)

6.) But wait! In #3 and #5 you found one function and your graphs seem to show multiple functions. Why is that? How could you change your answer for #3 and #5 to reflect this?