

18.01, September 10, 2003 Recitation suggestions

Whatever else you like. Good if you again explain what “proof of induction: mans (maybe prove B.T. now)

1. Students still fuzzy on limits. Not so important since we won't use limits “seriously” for a while. Will return in definition of integral and l' Hospital's rule. Maybe compute

$$\frac{d}{dx} \left(\frac{1}{x} \right) \text{ “by hand”, emphasizing limit, and then by the quotient rule.}$$

2. 1E-3 is a good problem, get to demonstrate “completing the square” yet again.

3. Use product rule to compute $\frac{d}{dx}(\sqrt{x})$

$$(v = \sqrt{x}, v \cdot v = x, \text{ so } 1 = \frac{d}{dx}(x) = \frac{d}{dx}(v \cdot v) = \frac{dv}{dx} \cdot v + v \cdot \frac{dv}{dx} = 2v \frac{dv}{dx} \Rightarrow \frac{dv}{dx} = \frac{1}{2v} v^{-\frac{1}{2}}).$$

Maybe do some other cases: $\frac{d}{dx}(x^{\frac{m}{2}})$, $\frac{d}{dx}(x^{\frac{1}{3}})$, $\frac{d}{dx}(x^{\frac{1}{n}})$???, $\frac{d}{dx}(x^{\frac{m}{n}})$???

4. Do some concrete graphic problems:

(a) Tangent line to $y=(x+1)(x+2)(x+3)$ at (0,6),

(b) Eq'n of tgt lines to $y=x^2$ passing through

5. Review volume of a prism: Vol=base x height

For “trough” in PS#1, 1, can “double” the trough to get a “box”