

WILL POST IMPORTANT ANNOUNCEMENTS
ON PIAZZA

(I)

MIDTERM FRIDAY @ 6 PM

YOU WILL BE ASKED TO :

- EVALUATE LIMITS TWO TRICKS
- FIND CONDITIONS TO MAKE PIECEWISE FUNCTION CTS
- COMPUTE DERIVATIVES \rightarrow RULES
 \rightarrow FROM DEFⁿ
- ANALYZE A BUSINESS PROBLEM
- INTERPRET DERIVATIVE \rightarrow RATE OF CHANGE
 \rightarrow SLOPE TANGENT
- USE IVT

ONE WEEK AWAY : • STUDY EVERYDAY
• DO PRACTISE X 2
• RE-SOLVE PROBLEMS

GET ENOUGH SLEEP $>$ STUDY

NOTATION

(II)

if A FUNCTION, DENOTE ITS DERIVATIVE AT x BY $f'(x)$ (IF IT EXISTS)

OFTEN DESCRIBE "f" AS ITS VALUE AT x , E.G. INSTEAD OF WRITING $f(x) = \frac{x^3+3}{2}$

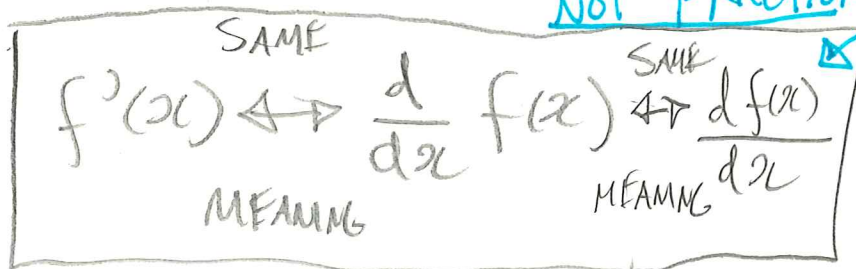
COULD SAY THE FUNCTION $\frac{x^3+3}{2}$

IN THESE CASES OFTEN WRITE

$\frac{d}{dx} \left(\frac{x^3+3}{2} \right)$ TO MEAN

$f'(x)$ WHERE $f(x) = \frac{x^3+3}{2}$

NOT FRACTION



III

$$\frac{d}{dx} \left(\frac{x^2 - 6x + 9}{x - 3} \right)$$

$$\frac{d}{dx} \left((x^2 - 1)(3x^2 + 4) \right)$$

$$\frac{d}{dx} \left(\frac{2x^4 - 3x + 9}{\sqrt{x}} \right)$$

$$\frac{d}{dx} \left((x^3 + x + 1)(2x^2 + x + 4) \right)$$

$$\frac{d}{dx} \left(\frac{x^3 - 1}{2} \right)$$

QUOTIENT / PRODUCT RULE

SIMPLIFY B4 OR
AFTER ?

DOES

IV

$$5^x - 10x - 7 = 0$$

HAVE A SOLUTION?

WHAT IS EQUATION OF
TANGENT LINE AT

$$f(x) = \frac{\cos(x)}{xe^x + 1}$$

AT $(0, 1)$

$$f'(x) = \frac{-\sin(x)(xe^x + 1) - \cos(x)(e^x + xe^x)}{(xe^x + 1)^2}$$

$$f'(0) = \frac{-(1+0)}{1} = -1$$

$$y(x) - 1 = -1(x - 0) \Rightarrow \boxed{y(x) = -x + 1}$$

$$f(x) = \begin{cases} \frac{x^2 - 25}{x + 5} & x < -5 \\ -3x^2 + x + a & x \geq -5 \end{cases}$$



How to choose a to be cts?

$$f(x) = x|x|$$

WHAT IS $f'(0)$?

WHY DOES YOUR ANSWER
MAKE SENSE?

QUIZZ LET $x \neq 0$

$$\frac{d}{dx} \sqrt{x} = ? \quad \text{EVALUATE USING DEFINITION}$$

STUDY & Look 3.6