

THUR 10-06-05

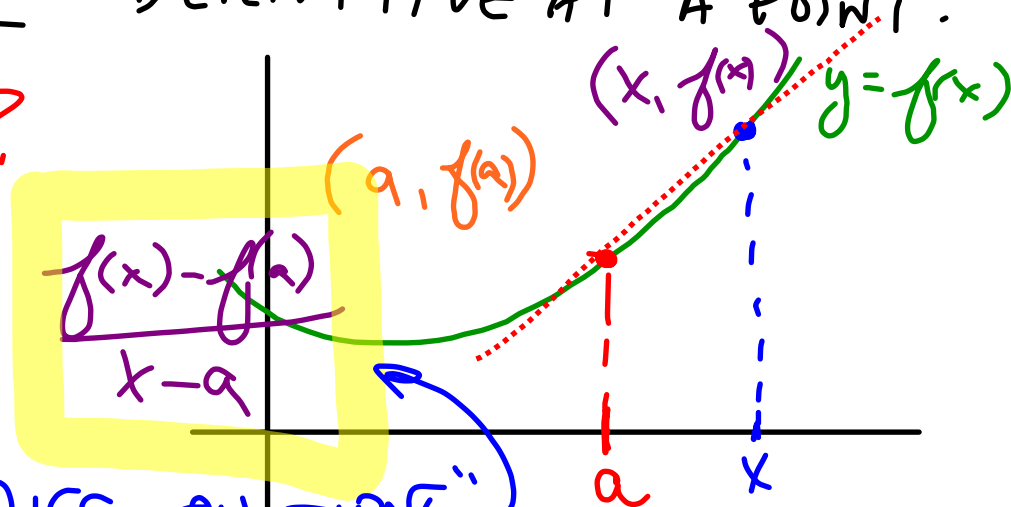
CHAP. 3 DERIVATIVE AT A POINT.

$m_{\text{tangent}} = ?$

$$m_{\text{sec}} = \frac{\Delta y}{\Delta x}$$

$$\frac{f(x) - f(a)}{x - a}$$

"DIFF. QUOTIENT"



$$m_{\text{tan}} = \lim_{x \rightarrow a} \frac{f(x) - f(a)}{x - a} = f'(a)$$

THE DERIVATIVE OF  $f$  AT  $x = a$

HUGE DEAL!

Ex)  $f(x) = x^2 - x$

a)  $m_{\text{tan}} = \lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x - 3}$

$= \lim_{x \rightarrow 3} \frac{(x-3)(x+2)}{(x-3)}$

$= \lim_{x \rightarrow 3} (x+2)$

$= \underline{\underline{5}}$

- FIND:
- a) SLOPE OF tan line TO  $f$  AT  $x = 3$
  - b) EQ. OF tan LINE @  $x = 3$
  - c) EQ. OF NORMAL LINE @  $x = 3$

$f'(3) = ? \underline{\underline{5}}$

INST. RATE OF CHANGE @  $x = 3$  IS  $\underline{\underline{5}}$

b) EQ. OF tan line

$m = 5 \quad (3, 6)$









$y = 5x - 9$

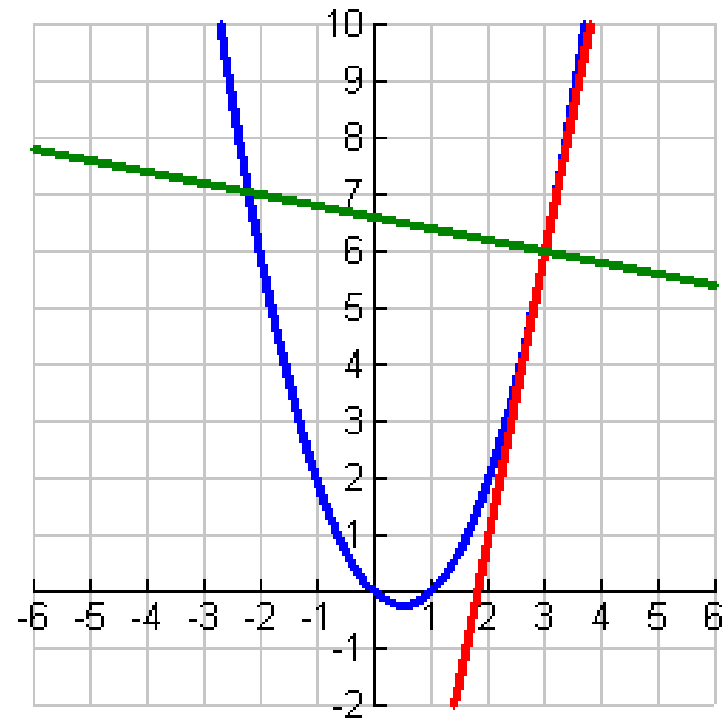
c) NORMAL LINE

$m_{\perp} = -\frac{1}{5} \quad (3, 6)$

$y = -\frac{1}{5}x + \frac{23}{5}$

Y= Stat Plots

|                                     |                                                                                   |                                                                                   |            |                |
|-------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------|----------------|
| <input checked="" type="checkbox"/> |  |  | $y1(x) :=$ | $x^2 - x$      |
| <input checked="" type="checkbox"/> |  |  | $y2(x) :=$ | $5x - 9$       |
| <input checked="" type="checkbox"/> |  |  | $y3(x) :=$ | $-1/5x + 33/5$ |
| <input type="checkbox"/>            |  |  | $y4(x) :=$ |                |



O.T.L.

FOR MONDAY:

GIFT 3.1 1-6

\*NEED GRAPH PAPER

TEST FRI: CHAP 2, LOGS/LN