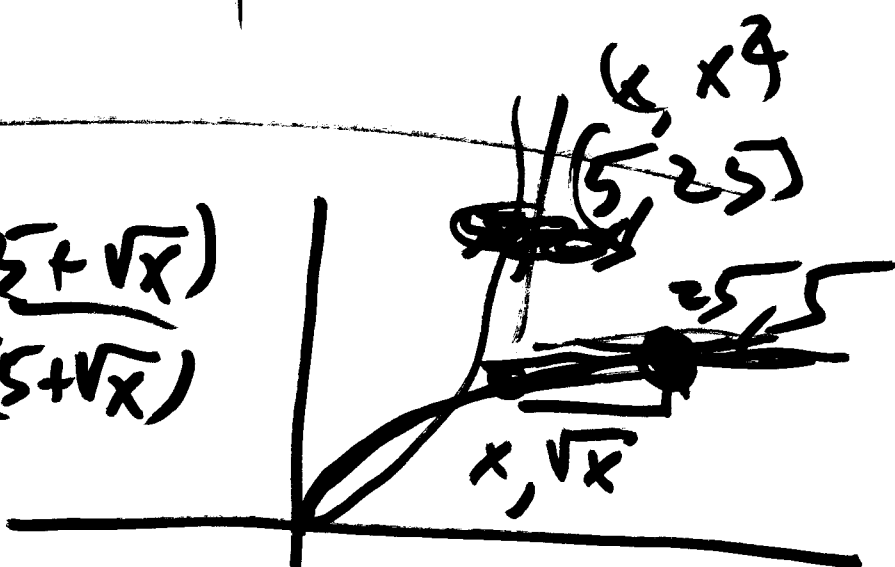


9/11  
1100

$$\lim_{s \rightarrow 1} \frac{s^3 - s}{s^2 - 1} = \lim_{s \rightarrow 1} \frac{s(s^2 - 1)}{s^2 - 1}$$

$$= \lim_{s \rightarrow 1} (s) = 1 \quad \text{--- } s \neq 1, -1$$

$$\lim_{x \rightarrow 25} \frac{(25 - x)(5 + \sqrt{x})}{(5 - \sqrt{x})(5 + \sqrt{x})}$$


$$\lim_{x \rightarrow 25} \frac{(25 - x)(5 + \sqrt{x})}{25 - x} = \frac{5 + \sqrt{x}}{5 + \sqrt{25}}$$

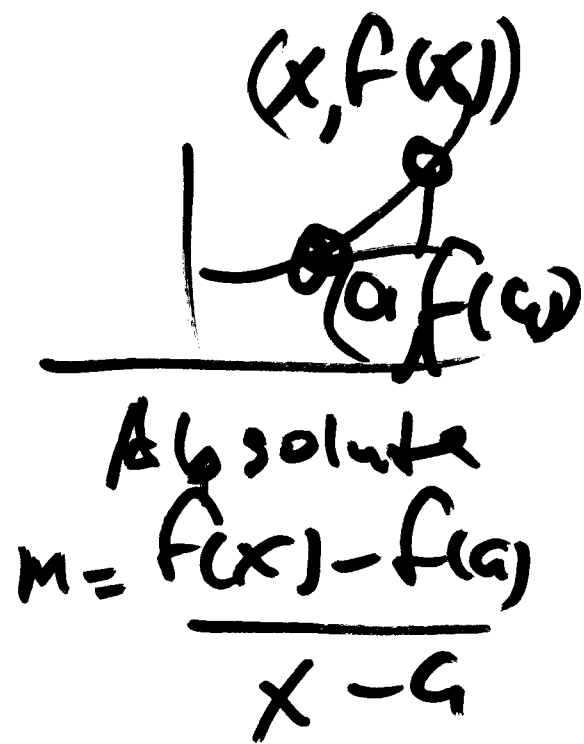
$$\frac{x}{x} = 1 \quad \text{except when } x = 0$$

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

//

$$\lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

$$h=0: \frac{f(a) - f(a)}{0} = \frac{0}{0}$$



Absolute

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

$$x = a + h$$

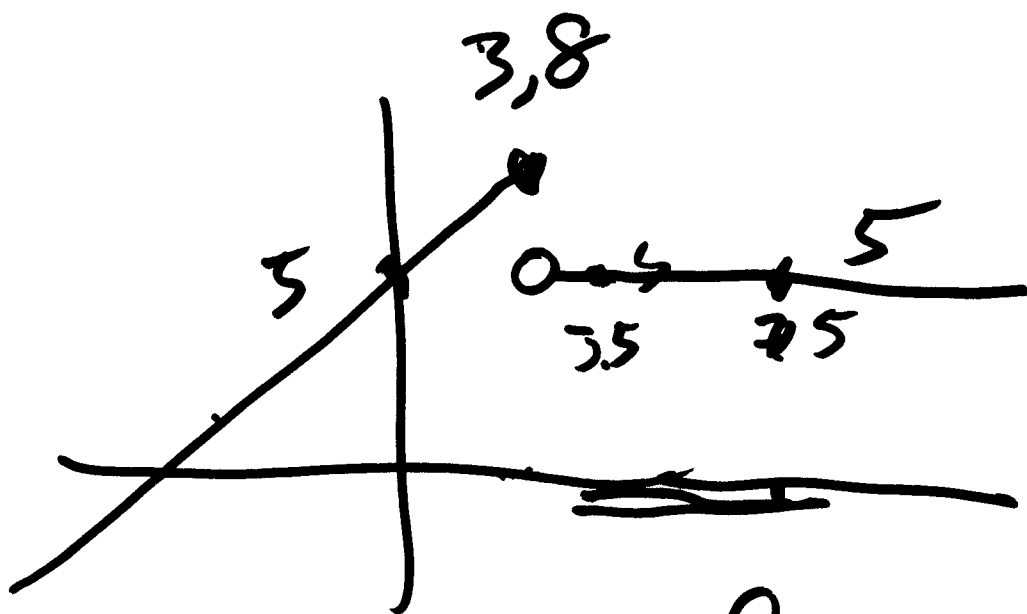
Relative

$$a + h - a =$$

Find Proxy Function same  
except at  $x=a$  ( $h=0$ ) that  
you can plug in to find "l.m.t"

$$f(x) = x + 5 \quad x \leq 3$$

$$f(x) = 5 \quad x > 3$$



$$\lim_{x \rightarrow 3^+} f(x) = 5$$

$$\lim_{x \rightarrow 3^-} f(x) = 8$$

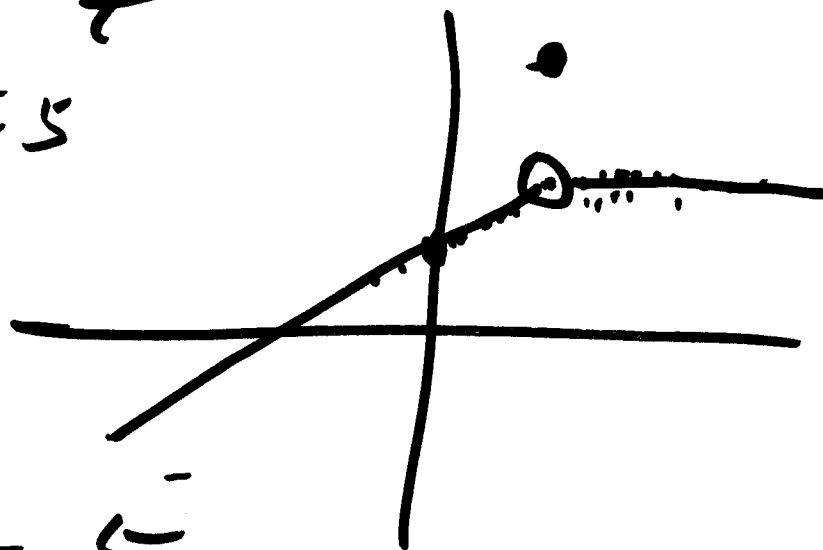
$$\lim_{x \rightarrow 3} f(x) = \text{Does not exist}$$

$$f(x) = x + 2 \quad x < 3$$

$$f(x) = 5 \quad x > 3$$

~~$$f(3) = 7$$~~

$$f(3) = 5$$



$$\lim_{x \rightarrow 3^+} f(x) = 5^-$$

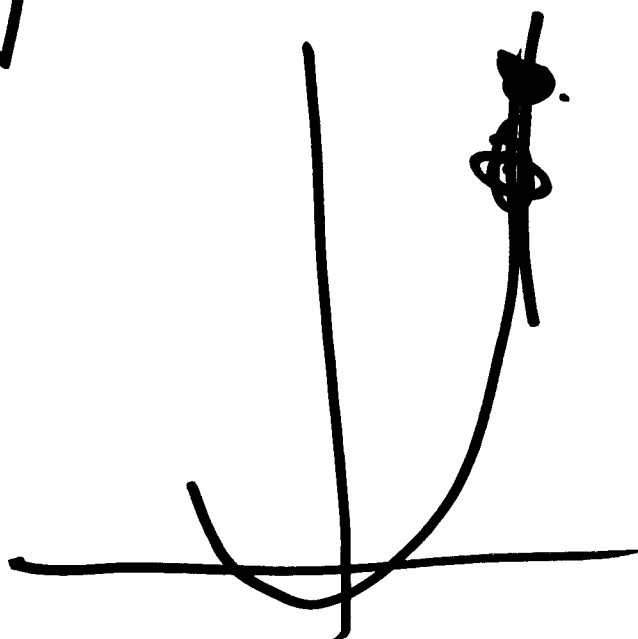
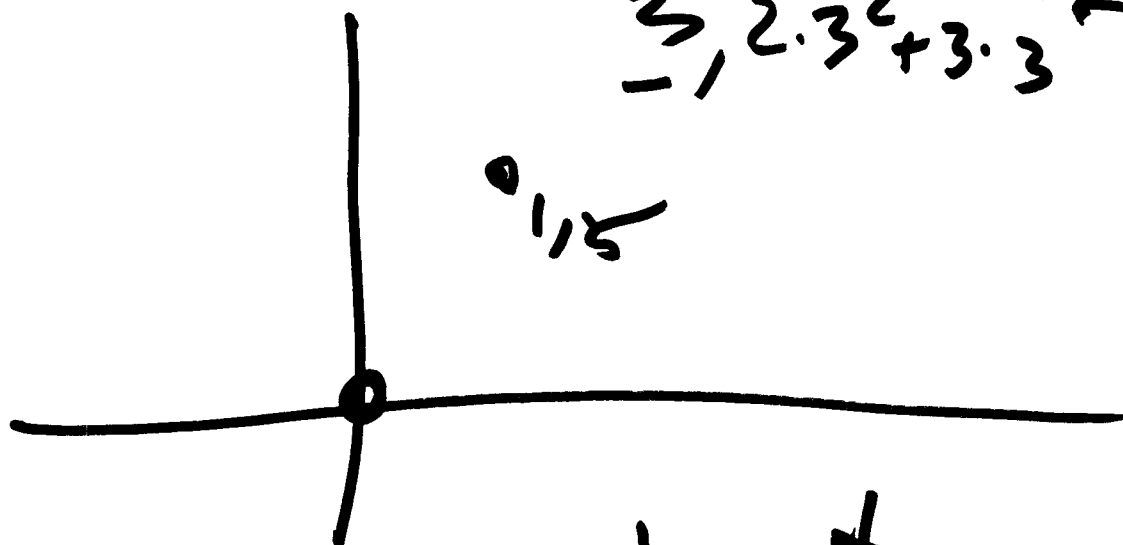
$$\lim_{x \rightarrow 3} f(x) = 5$$

$$\lim_{x \rightarrow 3} f(x) = 5$$

$$\lim_{h \rightarrow 0} \frac{2(3+h)^2 + 3(3+h) - (2(3^2) + 3 \cdot 3)}{h}$$

$$f(x) = 2x^2 + 3x$$

$(3+h, 2(3+h)^2 + 3(3+h))$   
 $(3, 2 \cdot 3^2 + 3 \cdot 3)$



$$\frac{2(3+h)^2 + 3(3+h) - (2(3^2) + 3 \cdot 3)}{h}$$

$$= \frac{2(\cancel{3^2} + 2 \cdot 3 \cdot h + h^2) + 3\cancel{3} + 3h - 2\cancel{3^2} - 3\cancel{3}}{h}$$

$$= \frac{2 \cdot 2 \cdot 3 \cdot h + 2h^2 + 3h}{h}$$

$$h \neq 0 = 2 \cdot 2 \cdot 3 + 2h^0 + 3$$

$$h > 0 \rightarrow 2 \cdot 2 \cdot 3 + 3$$