Practice Test #1

#1 Calculus is the study of change
functions are what is changing
derivative is slope of tangent line.

#2 $\lim_{x \to 2} 4x+3 = 11$

$$|4x+3-11| < \varepsilon$$
$$|4x-8| < \varepsilon$$
$$4|x-2| < \varepsilon$$
$$|x-2| < \frac{\varepsilon}{4}$$

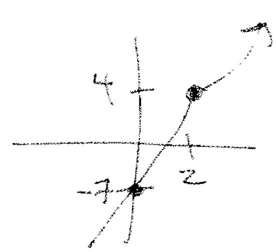
$$\delta = \frac{\varepsilon}{4}$$

#4 $\lim_{x \to 2^+} f(x) = 2^2 = 4$

$\lim_{x \to 2^-} f(x) = A(2) - 7$

so $2A - 7 = 4$
$2A = 11$
$A = 11/2$

Graph:



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#3

$$\lim_{x \to 3} \frac{x^2 - 5x + 6}{x^2 - 9}$$

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

$$= \lim_{x \to 3} \frac{x-2}{x+3}$$

$$= \frac{3-2}{3+3} = \boxed{\frac{1}{6}}$$

Continuous $= x \neq -3, 3$

Removable Discontinuous at $x = 3$

TEAM: C. A. M

A	U	A
S	G	N
A	U	D
N	S	U
D	T	K
R	I	H
A	N	A
		I

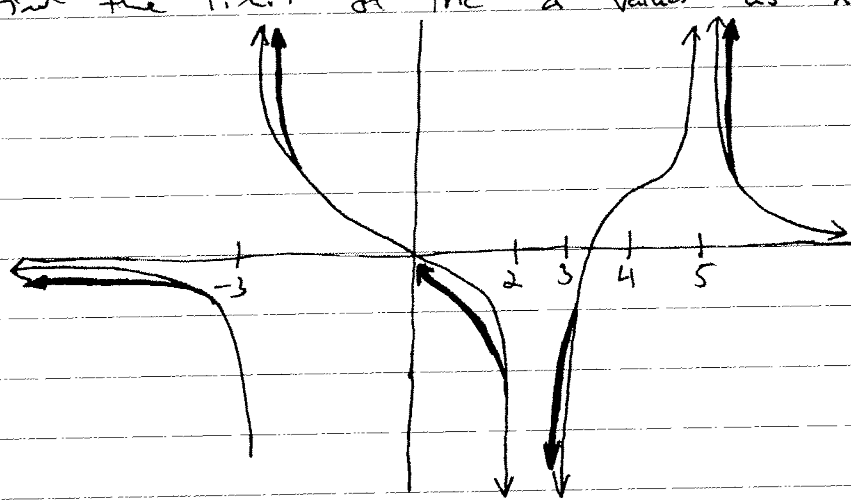
Team Diesel

Tyler Ferst, Connor Payne, Stanley Tuchez

#5 PRACTICE TEST

a	0	-3	5	2	0
$\lim_{x \to a^+} f(x)$	0	∞	∞	$-\infty$	0

Find the limit of the a values as $x \to a$ from the positive side



Table

➞	limits of a
→	Given Graph

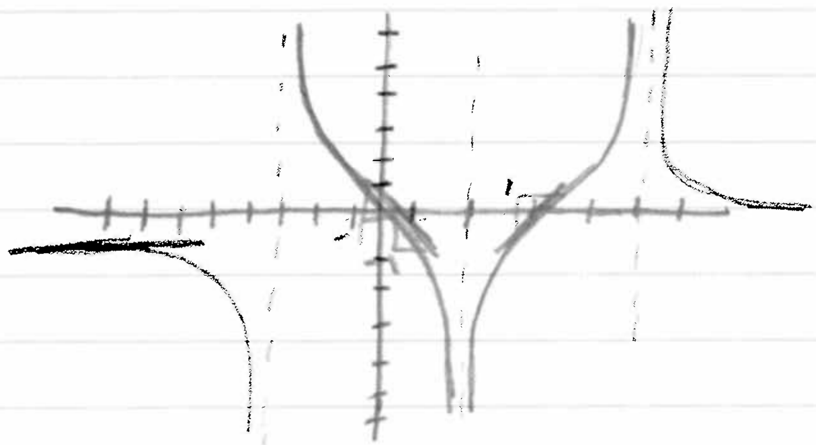
You can find the graph on pg 97 #8

EMPire

#6 Test review

determine approximate value of f'(x) at x = 1, 2, 3, 0

X =	1	2	3	0	$-\infty$
f'(x)	-1	UND	1	-1	0



Fabian Best
Laquan Drummer
Sal Jaragirdar

FR3CH

Mike
Vinh
Joan

7| $h(t) = t(2-t) + 3$

Evaluate the function at 0 and 2 and use that information to find average speed of the ball between $t=0$ and $t=2$.

$t=0$: $h(0) = 0(2-0) + 3 = 3$
$t=2$: $h(2) = 2(2-2) + 3 = 3$

$$\text{Average Speed} = \frac{h(2) - h(0)}{2 - 0} = \frac{3-3}{2} = 0$$

Good luck on the 1^{st} test!

Yves Mosoule
ABE CAPEN

THE GROUP

Test Sample #8

$$F(x) = x(x+1)$$

$$F(a+h) = (a+h)(a+h+1)$$
$$= \cancel{a^2} + 2ah + h^2 \cancel{+a} + h$$

$$F(a) = a(a+1)$$
$$= \cancel{a^2+a}$$

$$\frac{F(a+h)-F(a)}{h} = \frac{\cancel{h}(2a+h+1)}{\cancel{h}}$$

$$\lim_{h \to 0} = 2a \cancel{+h} + 1$$

$$\boxed{= 2a+1}$$

Pablo ESPICHAN
SANTOBIA

GRUNDLE PUMPISIS

$$f'(x) = \sqrt{x}\sin(\pi/3)$$

$$x^{\frac{1}{2}}\sin(\pi/3)$$

$$f'(x) = \tfrac{1}{2}x^{-\frac{1}{2}}\sin(\pi/3)$$

$$= \frac{\sqrt{3}}{4}x^{\frac{1}{2}}$$

$$f'(x)\ \frac{5\cos(x)}{x^4}$$

$$f'(x) = -5\sin(x)^{-4} + 5\cos(x) - (-4x^{-5})$$

$$\frac{-5\sin x}{x^4}\quad \frac{20\cos(x)}{x^5}$$

$$\frac{-5(\sin(x))x + 4\cos(x)}{x^4}$$

Team Kickass

#10 Find $g'(x)$: $g(x) = x^5 e^x$

$= 5x^4 \cdot e^x \cdot x^5 \cdot e^x$

$\frac{d}{dx} x^5 = 5x^{5-1} = 5x^4$

Find $g''(x)$: $5x^4 e^x + x^5 e^x + 20x^3 e^x + 5x^4 e^x$

SB & Pytha

\# 11 $y = (\ln x)(\sin x)$

(Product Rule) $y' = f(x) \cdot \frac{d}{dx} g(x) + \frac{d}{dx} f(x) \cdot g(x)$

$$= (\ln x) \cdot \frac{d}{dx}(\sin x) + \frac{d}{dx}(\ln x) \cdot \sin(x)$$

$$= (\ln x) \cdot (\cos x) + \left(\frac{1}{x}\right) \cdot (\sin x)$$

$$= \boxed{\ln x \cos x + \frac{\sin x}{x}}$$

We use product rule for this!

L.W.V

Wilgens
Letrice

2/17/10

(11) Find y' of $y = \frac{\sin x}{x}$

$$y' = \frac{g \cdot f' - fg'}{g^2}$$

$$y' = \frac{x\cos x - \sin x(1)}{(x)^2}$$

$$= \frac{x\cos x - \sin x}{x^2}$$

$$= \frac{\cancel{x}\cos x}{x^2} - \frac{\sin x}{x^2}$$

$$= \frac{\cos x}{x} - \frac{\sin x}{x^2}$$ Quotient Rule

#12. $\lim_{x \to \infty} \frac{.9x^{20} - 5x + 6}{x^{20} - 9} = \lim_{x \to \infty} \frac{.9 - \frac{5}{x^{19}} + \frac{6}{x^{20}}}{1 - 9/x^{20}}$

$= .9$

$\lim_{x \to \infty} \frac{-9x^{200} - 5x + 6}{x^{20} - 9} = \lim_{x \to \infty} \frac{-9x^{180} - 5/x^{19} + 6/x^{20}}{1 - 9/x^{20}}$

$= \lim_{x \to \infty} -9x^{180} = -\infty$

$\lim_{x \to \infty} \frac{.9x^{20} - 5x + 6}{x^{200} - 9} = \lim_{x \to \infty} \frac{.9/x^{180} - 5/x^{199} + 6/x^{200}}{1 - 9/x^{200}}$

$= 0$