CALCULUS
FLASH CARDS

Limits, Definitions

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for my Calc students

Instructions for Using the Flash Cards:

1. Cut along the horizontal lines only.

2. Fold along the vertical lines. This will result in a "flash card" with the term on one side and the definition or equivalent expression on the other. You may choose to tape or glue this paper card to a 3 x 5 card.

3. Use the flash cards at least 10 minutes a day. If you know the definition or formula, put it away for this session. If you don't know it, put it at the back of the stack and do it again.

4. Work with another student or by yourself.

5. You may work at school, at home, on the bus or train, or any place where you can pull the cards out. Every time you use them you will be working towards a good grade on the Calc exam.

$s(t) = \int v(t)\,dt$	**position function**
$s'(t) = v(t) = \int a(t)\,dt$	**velocity function**
$s''(t) = v'(t) = a(t)$	**acceleration function**
$\lvert s(t_1) - s(t_c) \rvert + \lvert s(t_c) - s(t_2) \rvert$ **where t_c = time particle changes direction**	**total distance t_1 to t_2**
definition of definite integral	$\lim_{x \to \infty} \sum_{i=1}^{n} f(c_i)\,\Delta x_i$

f(x) increasing	$f'(x) > 0$
$$\lim_{\Delta x \to 0} \frac{f(x+\Delta x)-f(x)}{\Delta x}$$	Derivative of y = f(x) at (x,f(x))
Interpretations of f '(x):	1. slope of tangent line 2. instantaneous velocity 3. instantaneous rate of change
Chain Rule	Find f '(x) for composite function
Given: $f(x) = g[h(x)]$ Find: $f'(x)$	$f'(x) = g'[h(x)] \cdot h'(x)$

slope of a curve at a point	**slope of the line tangent to the curve at that point**
$\lim_{x \to c} \frac{f(x)-f(c)}{x-c}$	**Derivative of y = f(x) at (c, f(c))**
Rolle's Theorum	**1. f(x) continuous [a,b]** **2. f(x) differentiable (a,b)** **3. f(a)=f(b)** **Then $\exists$ c on (a,b) $\ni$** **f ' (c) = 0**
Mean Value Thoerem	**1. f(x) continuous [a,b]** **2. f(x) differentiable (a,b)** **Then $\exists$ c on (a,b) $\ni$** $f'(c)=\frac{f(b)-f(a)}{b-a}$
Extreme Value Theorem	**If a function is continuous on a closed interval, then the function is guaranteed to have an absolute maximum and an absolute minimum in the interval.**

domain of $\sqrt{s(x)}$	**s(x) $\geq$ 0**
domain of $\frac{1}{s(x)}$	**s(x) $\neq$ 0**
domain of ln[s(x)]	**s(x) > 0**
even function	**symmetry with respect to y-axis** **or** **f(-x) = f(x)**
odd function	**symmetry with respect to origin** **or** **f(-x) = -f(x)**

$\frac{d[u \pm v]}{dx}$	$u' \pm v'$
$\frac{d[uv]}{dx}$	$uv' + vu'$
$\frac{d\left[\frac{u}{v}\right]}{dx}$	$\frac{vu' - uv'}{v^2}$
$\frac{d[u^n]}{dx}$	$nu^{n-1}u'$
$\frac{d[\ln u]}{dx}$	$\frac{u'}{u}$

$\dfrac{d[e^u]}{dx}$	$e^u u'$
$\dfrac{d[\sin u]}{dx}$	$(\cos u)u'$
$\dfrac{d[\cos u]}{dx}$	$-(\sin u)u'$
$\dfrac{d[\tan u]}{dx}$	$(\sec^2 u)u'$
$\dfrac{d[\sec u]}{dx}$	$(\sec u \tan u)u'$