Cheatography

Algebra, Calculus I & II Cheat Sheet

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Derivatives

Expression	Derivative
f(x)=k	f'(x)=0
f(x)=x	f'(x)=1
$f(x)=x^a$	$f'(x)=ax^{a-1}$
$f(x)=a^x$	$f'(x)=a^x$ lna
f(x)=kx	f'(x)=k
f(x)=1/x	$f'(x)=-1/x^2$
f(x)=ln x	f'(x)=1/x
$f(x)=e^u$	$f'(x)=u'.e^u$
f(x)=logaX	f'(x)=1/x lna
f(x)=sen(x)	f'(x)=cos(x)
f(x)=sec(x)	f'(x)=sec(x).tan(x)
f(x)=arcsen(x)	$f'(x)=1/\sqrt{1-x^2}$
f(x)=cos(x)	f'(x)=-sen(x)
f(x)=csc(x)	f'(x)=-csc(x).ctg(x)
f(x)=arccos(x)	$f'(x)=-1/\sqrt{1-x^2}$
f(x)=tan(x)	$f'(x)=sec^2(x)$
f(x)=ctg(x)	$f'(x)=-csc^2(x)$
f(x)=arctan(x)	$f'(x)=1/1+x^2$

Integrals

$\int x^k dx$	$(x^{k+1})/(k+1) + C$
$\int x^{-1} dx$	ln|x| + C
∫dx	x + C
∫kF(x)dx	k∫F(x)dx
∫[F(x)±∫G(x)]	∫F(x)dx ± ∫G(x)dx
$\int e^{kx} dx$	$(1/k)e^{kx} + C$
$\int a^{kx} dx$	a^{kx}/[kLn(a)] + C
∫sen(kx) dx	-(1/k) cos(kx) + C
∫cos(kx) dx	1/k sen(kx) + C
∫sec(kx) dx	1/k(Ln|sec(kx) + tan(kx)|) + C
∫Tan(kx) dx	-(1/k) Ln|cos(kx)| + C
∫csc(kx) dx	1/k Ln |csc(kx) - cot(kx)| + C
∫cot(kx) dx	1/k Ln |sen(kx)| + C
∫sec(kx) dx	1/k sec(kx) + C
∫csc(kx) cot(kx) dx	-1/k csc(kx) + C
$\int sex^2(kx)$ dx	1/k tan(kx) + C
$\int csc^2(kx)$ dx	-1/k cot(kx) + C

Quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Factoring

$(a + b)^2$	$a^2 + 2ab + b^2$
$(a - b)^2$	$a^2 - 2ab + b^2$
$a^2 - b^2$	(a - b) (a + b)
$(a + b)^3$	$a^3 + 3a^2b + 3ab^2 + b^3$
$(a - b)^3$	$a^3 - 3a^2b + 3ab^2 - b^3$
$a^3 - b^3$	(a - b)^3 + 3ab (a - b)
$a^3 + b^3$	$(a + b)^3$ - 3a b (a + b)

Factoring

Given x^2+ax+b=0, then you have to find two numbers that when **multiplied** give you **B** and **added** give you **a**.

Example:

x^2+4x+3, turns into: (x+3)(x+1)

Absolute value propertie

|x|>a	x>a or a<-a
|x|<a	-a<x<a

Divisions with 0

0/n	0
n/∞	0
n/0	∞

Logs properties

$loga B^n$	nlogaB
logaA=lne	1
loga1=ln1	0
loga(m.n)	logaM + logaN
loga(m/n)	logaM - logaM

Exponential properties

a^0	1
a^1	a
$a^m . a^n$	a^{m+n}
a^m / a^n	a^{m-n}
$(a.b)^n$	$a^n . b^n$
$(a/b)^n$	a^n/b^n
$(a^m)^n$	$a^{m.n}$
$a^{n/m}$	raiz m de a^n
a^{-1}	1/a

Trigonometrical identities

$sen^2 \alpha + cos^2 \alpha = 1$
$sec^2 \alpha = 1 + tg^2 \alpha$
$cosec^2 \alpha = 1 + cotg^2 \alpha$
tan α = senα/cosα
$tan^2 \alpha +1 = sec^2 \alpha$
$cot^2 \alpha +1 = csc^2 \alpha$
sin(x + y) = sin(x) cos(y) + cos(x) sin(y)
cos(x + y) = cos(x) cos(y) − sin(x) sin(y)
tan(x + y) = (tan(x) + tan(y))/(1 − tan(x) tan(y))
sin(x − y) = sin(x) cos(y) − cos(x) sin(y)
cos(x − y) = cos(x) cos(y) + sin(x) sin(y)
tan(x − y) = (tan(x) − tan(y))/(1 + tan(x) tan(y))
sin (2 x) = 2 sin (x) cos (x)
cos (2 x) = cos2 (x) − sin2 (x)
cos (2 x) = 2 cos2 (x) − 1
tan (2 x) = (2 tan (x))/(1 − tan2 (x))
sin2 (x) = 1/2 (1 − cos (2 x))
cos2 (x) = 1/2 (1 + cos (2 x))
sin (x) cos (x) = 1/2 sin (2 x)
sin (x) sin (y) = 1/2 (cos (x − y) − cos (x + y))

Trigonometrical identities (cont)

sin (x) cos (y) = 1/2 (sin (x − y) + sin (x + y))
cos (x) cos (y) = 1/2 (cos (x − y) + cos (x + y))
csc(x) = 1/sin(x)
sec(x) = 1/cos(x)
cot(x) = cos(x)/tan(x)
sin(−x) = − sin(x)
cos(−x) = cos(x)
tan(−x) = − tan(x)