

Calculus: Basic Functions for instant recall

	diff	int	simple u-sub
power	$\frac{d}{dx} x^n = n x^{n-1}$	$\int x^n dx = \frac{x^{n+1}}{n+1} + C$	$\int (ax+b)^n dx = \frac{(ax+b)^{n+1}}{a(n+1)} + C$
ln	$\frac{d}{dx} \ln x = \frac{1}{x}$	$\int \frac{1}{x} dx = \ln x + C$	$\int \frac{1}{ax+b} dx = \frac{1}{a} \ln ax+b + C$
exp	$\frac{d}{dx} e^x = e^x$	$\int e^x dx = e^x + C$	$\int e^{ax} dx = \frac{1}{a} e^{ax} + C$
trig	$\frac{d}{dx} \sin x = \cos x$ $\frac{d}{dx} \cos x = -\sin x$	$\int \cos x dx = \sin x + C$ $\int \sin x dx = -\cos x + C$	$\int \cos ax dx = \frac{1}{a} \sin ax + C$ $\int \sin ax dx = -\frac{1}{a} \cos ax + C$
chain/ u-sub	$\frac{d}{dx} f(u) = \underbrace{f'(u)}_{\frac{df}{du}} \frac{du}{dx}$	$\int f(u(x)) \frac{du(x)}{dx} dx = \int f(u) du = F(u) + C = F(u(x)) + C$ if $F'(x) = f(x)$ "antiderivative"	
additive constant	$\frac{d}{dx} (f(x) + c) = \frac{d}{dx} f(x)$		} + ≠ * !
multiplicative constant	$\frac{d}{dx} (c f(x)) = c \frac{d}{dx} f(x)$	$\int c f(x) dx = c \int f(x) dx$	

You are expected to be able to do any of the above explicit integrals by hand, or any that can be reduced to them by an obvious u-substitution. Any derivative or integral you are uncertain of you are expected to check symbolically with Maple or your graphing calculator. There is no excuse for getting a derivative or integral wrong with technology at your fingertips.

MAT 2500 = CALC 3 and MAT 2705 = DE w/ Lin Alg assume these basic operations from CALC 1 and CALC 2 and build on them.