

Applied Calculus Nova - app_calc_formulas_nova.doc

$P'(t) = kP_0$ (The population growth is directly proportional to the amount present at any given time)

$y = ce^{kt}$ (Growth/Decay)

$A = Pe^{rt}$ (Continuous compounding)

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Product Rule:

$$\frac{d(uv)}{dx} = u'v + uv'$$

Quotient Rule:

$$\frac{d\left(\frac{u}{v}\right)}{dx} = \frac{u'v - uv'}{v^2}$$

General Power Rule w/Chain Rule:

$$\frac{d(u^n)}{dx} = nu^{n-1}u'$$

General exponential Rule

$$\frac{d(e^u)}{dx} = e^u u'$$

General ln Rule

$$\frac{d(\ln u)}{dx} = \frac{1}{u} u'$$

Power Rule

$$\int x^n dx = \frac{x^{n+1}}{(n+1)} + C$$

Power Rule w/k

$$\int (x+k)^n dx = \frac{(x+k)^{n+1}}{(n+1)} + C$$

Power Rule w/c and k

$$\int (cx+k)^n dx = \frac{(cx+k)^{n+1}}{c(n+1)} + C$$

ln Rule

$$\int \frac{1}{x} dx = \ln x + C$$

ln Rule w/ k

$$\int \frac{1}{x+k} dx = \ln(x+k) + C$$

ln Rule w/c and k

$$\int \frac{1}{cx+k} dx = \frac{\ln(cx+k)}{c} + C$$

Exponential Rule

$$\int e^x dx = e^x + C$$

Exponential Rule w/k

$$\int e^{x+k} dx = e^{x+k} + C$$

Exponential Rule w/c and k

$$\int e^{cx+k} dx = \frac{e^{cx+k}}{c} + C$$

Average Value

$$\frac{1}{b-a} \int_a^b f(x) dx$$

Consumer's Surplus

$$\int_0^A [f(x) - B] dx$$

$A = \text{qty. demanded}$

$B = f(A) = \text{price}$

Solid of Revolution

$$\int_a^b \pi [g(x)]^2 dx$$

The Future Value of a Continuous Income Stream of K dollars per year for N years at interest rate r compound continuously is

$$\int_0^N Ke^{r(N-t)} dt$$

Quick Basic

$$\int f(x) dx = F(x) + C$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$\int e^{kx} dx = \frac{e^{kx}}{k} + C$$

$$\int x^{-1} dx = \int \frac{1}{x} dx = \ln |x| + C$$

Average Value of a function over the interval $[a, b]$

$$\frac{1}{b-a} \int_a^b f(x) dx$$