CALC 103

TEST 2 FORMULA SHEET

Derivatives:

* $\frac{d}{dx}[C]=0 \quad C=\text{constant}$ * $\frac{d}{dx}[kx+C\ ]=k \quad k$ and C are constants

* $\frac{d}{dx}[cx^n]=cnx^{n-1}$ (*Power of x Rule*) * $\frac{d}{dx}[cu^n]=cnu^{n-1}\frac{du}{dx}=cnu^{n-1}\cdot u'$ (*Power of a Function of x Rule*)

* $\frac{d}{dx}[u+v]=u'+v'$ (Sum Rule) * $\frac{dy}{dx}=\frac{dy}{du}\cdot\frac{du}{dx}$ (Chain Rule)

* $\frac{d}{dx}[uv]=\frac{du}{dx}v+\frac{dv}{dx}u=u'v+uv'$ (Product Rule)

* $\frac{d}{dx}\left[\frac{u}{v}\right]=\frac{\frac{du}{dx}v-\frac{dv}{dx}u}{v^2}=\frac{u'v-uv'}{v^2}$ (Quotient Rule)

* $\frac{d}{dx}[\sin u]=\cos u\cdot\frac{du}{dx}$ * $\frac{d}{dx}[\cos u]=-\sin u\cdot\frac{du}{dx}$ * $\frac{d}{dx}[\tan u]=\sec^2 u\cdot\frac{du}{dx}$

* $\frac{d}{dx}[\sec u]=\sec u\tan u\cdot\frac{du}{dx}$ * $\frac{d}{dx}[\csc u]=-\csc u\cot u\cdot\frac{du}{dx}$ * $\frac{d}{dx}[\cot u]=-\csc^2 u\cdot\frac{du}{dx}$

* $\frac{d}{dx}[\log_b u]=\frac{1}{u\ln b}\cdot\frac{du}{dx}$ * $\frac{d}{dx}[\ln u]=\frac{1}{u}\cdot\frac{du}{dx}$

* $\frac{d}{dx}[b^u]=b^u\cdot\ln b\cdot\frac{du}{dx}$ * $\frac{d}{dx}[e^u]=e^u\cdot\frac{du}{dx}$

*Properties of Logarithm:

$\log_b AB=\log_b A+\log_b B$

$\log_b \frac{A}{B}=\log_b A-\log_b B$

$\log_b A^P=P\log_b A$

Integrations:

* $\int a\,f(x)dx=a\int f(x)dx$ * $\int[f(x)\pm g(x)]dx=\int f(x)dx\pm\int g(x)dx$

* $\int du=u+C$ * $\int u^n du=\frac{u^{n+1}}{n+1}+C \quad (n\neq -1)$

* $\int\frac{du}{u}=\ln|u|+C \quad (u\neq 0)$