CALC 203

TEST 1 FORMULA SHEET

- Assume u & v are the functions of x.

***Differentiation*:**

$$\frac{d}{dx}\left[cu^n\right]=cnu^{n-1}\cdot u' \quad \frac{d}{dx}\left[\ln u\right]=\frac{u'}{u} \quad \frac{d}{dx}\left[\log_b u\right]=\frac{u'}{u\ln b} \quad \frac{d}{dx}\left[e^u\right]=e^u\cdot u' \quad \frac{d}{dx}\left[b^u\right]=b^u\cdot\ln b\cdot u'$$

$$\frac{d}{dx}\left[\sin u\right]=\cos u\cdot u' \quad \frac{d}{dx}\left[\cos u\right]=-\sin u\cdot u' \quad \frac{d}{dx}\left[\tan u\right]=\sec^2 u\cdot u' \quad \frac{d}{dx}[\cot u]=-\csc^2 u\cdot u'$$

$$\frac{d}{dx}\left[\sec u\right]=\sec u\tan u\cdot u' \quad \frac{d}{dx}\left[\csc u\right]=-\csc u\cot u\cdot u' \quad \frac{d}{dx}\left[uv\right]=u'v+uv' \quad \frac{d}{dx}\left[\frac{u}{v}\right]=\frac{u'v-uv'}{v^2}$$

***Integration*:**

$$\int u^n du=\frac{u^{n+1}}{n+1}+C\ (n\neq -1) \qquad \int\frac{1}{u}\,du=\ln|u|+C \qquad \int e^u du=e^u+C$$

$$\int\sin u\ du=-\cos u+C \qquad \int\cos u\ du=\sin u+C \qquad \int\tan u\ du=-\ln|\cos u|+C$$

$$\int\cot u\ du=\ln|\sin u|+C \qquad \int\sec u\ du=\ln|\sec u+\tan u|+C \qquad \int\csc u\ du=\ln|\csc u-\cot u|+C$$

$$\int\sin^2 u\ du=\frac{u}{2}-\frac{\sin 2u}{4}+C \qquad \int\cos^2 u\ du=\frac{u}{2}+\frac{\sin 2u}{4}+C \qquad \int\tan^2 u\ du=\tan u-u+C$$

$$\int\cot^2 u\ du=-\cot u-u+C \qquad \int\sec^2 u\ du=\tan u+C \qquad \int\csc^2 u\ du=-\cot u+C$$

$$y_{avg}=\frac{1}{b-a}\int_a^b f(x)dx \qquad rms=\sqrt{\frac{1}{b-a}\int_a^b\left[f(x)\right]^2 dx}$$

By Parts $\int u\,dv=uv-\int v\,du$

***Properties of Logarithm*:**

$$\ln AB=\ln A+\ln B \qquad \ln\frac{A}{B}=\ln A-\ln B \qquad \ln A^P=P\ln A$$