Math 142 Integration Formulas

You should know and be able to use all of the following formulas.

Power Rule ($n \neq -1$)

$$\int u^n \, du = \frac{u^{n+1}}{n+1} + C$$

Trig Functions

$$\int \sin u \, du = -\cos u + C \qquad \int \cos u \, du = \sin u + C$$

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

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

Logarithm Rule

$$\int \frac{1}{u} \, du = \ln|u| + C$$

Exponential Rules ($b > 0$ **and** $b \neq 1$)

$$\int b^u \, du = \frac{b^u}{\ln b} + C \qquad \int e^u \, du = e^u + C$$

Inverse Trig Functions ($a > 0$)

$$\int \frac{1}{1+u^2} \, du = \tan^{-1} u + C \qquad \int \frac{1}{a^2+u^2} \, du = \frac{1}{a} \tan^{-1} \frac{u}{a} + C$$

$$\int \frac{1}{\sqrt{1-u^2}} \, du = \sin^{-1} u + C \qquad \int \frac{1}{\sqrt{a^2-u^2}} \, du = \sin^{-1} \frac{u}{a} + C$$

$$\int \frac{1}{u\sqrt{u^2-1}} \, du = \sec^{-1}|u| + C \qquad \int \frac{1}{u\sqrt{u^2-a^2}} \, du = \frac{1}{a} \sec^{-1} \frac{|u|}{a} + C$$