MA-163
Short List of Integrals
(For Tests 3, 4, 5)

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

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

$$\int e^u\,du = e^u$$

$$\int \frac{du}{u} = \ln|u|$$

$$\int ue^u du = ue^u - e^u$$

$$\int \sin u\,du = -\cos u$$

$$\int \cos u\,du = \sin u$$

$$\int \sec^2 u\,du = \tan u$$

$$\int \sec u \tan u\,du = \sec u$$

$$\int \csc u \cot u\,du = -\csc u$$

$$\int \csc^2 u\,du = -\cot u$$

$$\int \tan u\,du = \ln|\sec u|$$

$$\int \cot u\,du = \ln|\sin u|$$

$$\int \sec u\,du = \ln|\sec u + \tan u|$$

$$\int \csc u\,du = \ln|\csc u - \cot u|$$

$$\int \cos^2 u\,du = \frac{1}{2}(u + \sin u \cos u)$$

$$\int \frac{du}{u^2 + a^2} = \frac{1}{a}\arctan\frac{u}{a}$$

$$\int \frac{du}{\sqrt{a^2 - u^2}} = \arcsin\frac{u}{a}$$

$$\int \frac{du}{u\sqrt{a^2 - u^2}} = \frac{1}{a}\operatorname{arcsec}\frac{u}{a}$$

$$\int \sqrt{a^2 - u^2}\,du = \frac{u}{2}\cdot\sqrt{a^2 - u^2} + \frac{a^2}{2}\cdot\sin^{-1}\left(\frac{u}{a}\right)$$

$$\int \sqrt{u^2 + a^2}\,du = \frac{u}{2}\cdot\sqrt{u^2 + a^2} + \frac{a^2}{2}\cdot\ln\left(u + \sqrt{u^2 + a^2}\right)$$

$$\int u\cdot\sqrt{u^2 + a^2}\,du = \frac{1}{3}\cdot(u^2 + a^2)\cdot\sqrt{u^2 + a^2}$$

$$\int u^2\sqrt{u^2 + a^2}\,du = \frac{u}{8}(2u^2 + a^2)\sqrt{u^2 + a^2} - \frac{a^4}{8}\ln\left(u + \sqrt{u^2 + a^2}\right)$$