MATH 141, FALL 2011

Integrals to start with (use integration by parts):

$$\int \left(\frac{\ln(x)}{x}\right)^2 \, dx = -\frac{1}{x}(\ln^2(x) + 2\ln(x) + 2) + C$$

$$\int \sqrt{x}\ln^2(x) \, dx = \frac{2}{3}x^{3/2}\left(\ln^2(x) - \frac{4}{3}\ln(x) + \frac{8}{9}\right) + C$$

$$\int xe^{-x} \, dx = -(x+1)e^{-x} + C$$

$$\int x^2e^{-2x} \, dx = -\frac{e^{-2x}}{2}\left(x^2 + x + \frac{1}{2}\right) + C$$

$$\int x^3e^{-x^2} \, dx = -\frac{x^2+1}{2}e^{-x^2} + C$$

$$\int x^2\sin(2x) \, dx = -\frac{2x^2-1}{4}\cos(2x) + \frac{x}{2}\sin(2x) + C$$

$$\int \arcsin(x) \, dx = x\arcsin(x) + \sqrt{1-x^2} + C$$

$$\int x\arctan(x) \, dx = -\frac{x}{2} + \frac{1+x^2}{2}\arctan(x) + C$$

$$\int x^2\arccos(x) \, dx = -\frac{2+x^2}{9}\sqrt{1-x^2} + \frac{x^3}{3}\arccos(x) + C$$

$$\int \frac{\arcsin(x)}{x^2} \, dx = -\frac{\arcsin(x)}{x} - \ln\left(\left|\frac{1+\sqrt{1-x^2}}{x}\right|\right) + C$$

$$\int \ln(x+\sqrt{1+x^2}) \, dx = x\ln\left(x+\sqrt{1+x^2}\right) - \sqrt{1+x^2} + C$$

$$\int x\ln\left(\frac{1+x}{1-x}\right) \, dx = x - \frac{1-x^2}{2}\ln\left(\frac{1+x}{1-x}\right) + C$$

$$\int \sin(x)\ln(\tan(x)) \, dx = \ln(\tan(x/2)) - \cos(x)\ln(\tan(x)) + C$$