$$\int_{-1}^{0} \frac{x\,dx}{x^2+3x+3}$$

$$\int_{0}^{1} \frac{dx}{\sqrt{x(1-x)}}$$

$$\int x \arctan x\,dx$$

$$\int_{-\infty}^{\infty} \frac{dx}{\cosh x}$$

$$\int_{0}^{\pi} \frac{\cos x}{2+\cos x}\,dx$$

$$\int_{0}^{2\pi} \frac{\cos x}{2+\cos x}\,dx$$

$$\int \frac{(e^x+1)(e^{2x}+1)}{e^{3x}+1}\,dx$$

$$\int x^3(\ln x)^2\,dx$$

$$\int_{0}^{\pi/3} \tan x\,dx$$

$$\int \frac{x^4+1}{x^3+1}\,dx$$

$$\int \exp(-\sqrt{x})\,dx$$

$$\int \sqrt{\frac{1-x}{1+x}}\,dx$$

$$\int (\arcsin x)^2\,dx$$

$$\int_{0}^{t} \cos ax\, e^{-bx}\,dx$$

$$\int x \sin^2(x^2)\,dx$$

$$\int \sin(\ln x)\,dx$$

Look at all those hwk problems that tell you about key integrals that cannot be evaluated in terms of elementary functions. Know the Euler Formula and be able to switch from trigs to exponentials and back. Know how to use the $\tan\frac{x}{2}$ substitution. (The trig identities needed will be provided). Be able to select easy and intractable integrals out of a pool of similar-looking problems. I may give problems of the type "Use integration by parts on $\int dx/(1+x^2)$ to evaluate $\int dx/(1+x^2)^2$."