SOME USEFUL REDUCTION FORMULAS
MATH 1352

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

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

(3) $$\int \tan^n(x)\,dx = \frac{1}{n-1}\tan^{n-1}(x) - \int \tan^{n-2}(x)\,dx$$

(4) $$\int \cot^n(x)\,dx = -\frac{1}{n-1}\cot^{n-1}(x) - \int \cot^{n-2}(x)\,dx$$

(5) $$\int \sec^n(x)\,dx = \frac{1}{n-1}\sec^{n-2}(x)\tan(x) + \frac{n-2}{n-1}\int \sec^{n-2}(x)\,dx$$

(6) $$\int \csc^n(x)\,dx = -\frac{1}{n-1}\csc^{n-2}(x)\cot(x) + \frac{n-2}{n-1}\int \csc^{n-2}(x)\,dx$$

(7) $$\int \sin^p(x)\cos^q(x)\,dx$$
$$= \frac{1}{p+q}\sin^{p+1}(x)\cos^{q-1}(x) + \frac{q-1}{p+q}\int \sin^p(x)\cos^{q-2}(x)\,dx$$

(8)
$$= -\frac{1}{p+q}\sin^{p-1}(x)\cos^{q+1}(x) + \frac{p-1}{p+q}\int \sin^{p-2}(x)\cos^q(x)\,dx$$

(9) $$\int \frac{1}{(a^2+x^2)^{n+1}}\,dx = \frac{1}{2na^2}\frac{x}{(x^2+a^2)^n} + \frac{2n-1}{2na^2}\int \frac{1}{(x^2+a^2)^n}\,dx$$