Handy Facts for Math 3B, Section 7.2

$$\cos(2x) = \cos^2(x) - \sin^2(x) = 1 - 2\sin^2(x) = 2\cos^2(x) - 1$$

$$\cos^2(x) = 1 - \sin^2(x) = \frac{1}{2}(1+\cos(2x)) \quad \text{and in general, } \cos^2(Ax) = \frac{1}{2}(1+\cos(2Ax))$$

$$\sin^2(x) = 1 - \cos^2(x) = \frac{1}{2}(1-\cos(2x)) \quad \text{and in general, } \sin^2(Ax) = \frac{1}{2}(1-\cos(2Ax))$$

$$\sec^2(x) = \tan^2(x) + 1$$

$$\tan^2(x) = \sec^2(x) - 1$$

$$\csc^2(x) = \cot^2(x) + 1$$

$$\cot^2(x) = \csc^2(x) - 1$$

$$\int \tan(x)dx = \ln|\sec(x)| + C$$

$$\int \cot(x)dx = \ln|\sin(x)| + C$$

$$\int \sec(x)dx = \ln|\sec(x) + \tan(x)| + C$$

$$\int \csc(x)dx = \ln|\csc(x) - \cot(x)| + C$$

$$\int \sec^2(x)dx = \tan(x) + C$$

$$\int \csc^2(x)dx = -\cot(x) + C$$

$$\int \sec(x)\tan(x)dx = \sec(x) + C$$

$$\int \csc(x)\cot(x)dx = -\csc(x) + C$$

$$\int \sin(x)\cos^n(x)dx = -\frac{1}{n+1}\cos^{n+1}(x) + C, \text{ for } n \neq -1$$

$$\int \cos(x)\sin^n(x)dx = \frac{1}{n+1}\sin^{n+1}(x) + C, \text{ for } n \neq -1$$

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

$$\int \sec(x)\tan(x)\sec^n(x)dx = \frac{1}{n+1}\sec^{n+1}(x) + C, \text{ for } n \neq -1$$

$$\int \csc(x)\cot(x)\csc^n(x)dx = -\frac{1}{n+1}\csc^{n+1}(x) + C, \text{ for } n \neq -1$$

$(1+A)^3 = 1 + 3A + 3A^2 + A^3$

$(1-A)^3 = 1 - 3A + 3A^2 - A^3$

$(1+A)^4 = 1 + 4A + 6A^2 + 4A^3 + A^4$

$(1-A)^4 = 1 - 4A + 6A^2 - 4A^3 + A^4$