

Integrals with Trigonometry

Products of powers of sines and cosines

Case 1: m is odd let $m = 2k + 1$.

Case 2: m is even and n is odd.

$$n = 2k + 1$$

Case 3: m and n are both even.

$$\text{Ex. } \int_0^{\pi} \sin^5\left(\frac{x}{2}\right) dx =$$

$$\int_0^{\pi/2} \sin^2(2\theta) \cos^3(2\theta) d\theta =$$

$$\int_0^{\pi} \sqrt{1 - \cos(2x)} dx =$$

$$\cos[(\alpha - \beta)x] = \cos \alpha x \cos \beta x + \sin \alpha x \sin \beta x$$

$$\cos[(\alpha + \beta)x] = \cos \alpha x \cos \beta x - \sin \alpha x \sin \beta x$$

Product to sum identities

$$\int_0^{\pi/2} \sin(2x)\cos(3x)dx$$

$$\int_0^{\pi} 8\sin^4 y \cos^2 y dy =$$