

Section 7.2: Trigonometric IntegralsExtremely Useful Trig Identities

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

$$\cos^2(x) = \frac{1}{2}(1 + \cos(2x))$$

$$\sin(2x) = 2 \sin(x) \cos(x)$$

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

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

Sometimes Useful Trig Identities

$$\sin(A) \cos(B) = \frac{1}{2} [\sin(A - B) + \sin(A + B)]$$

$$\sin(A) \sin(B) = \frac{1}{2} [\cos(A - B) - \cos(A + B)]$$

$$\cos(A) \cos(B) = \frac{1}{2} [\cos(A - B) + \cos(A + B)]$$

Compute these integrals

Example: $\int \sin(5x) \sin(4x) dx$

Example: $\int \sin(7x) \cos^4(7x) dx$

$$\int \sin^m(x) \cos(x) dx$$

$$\int \sec^m(x) \sec(x) \tan(x) dx$$

$$\int \cos^m(x) \sin(x) dx$$

$$\int \cot^m(x) \csc^2(x) dx$$

$$\int \tan^m(x) \sec^2(x) dx$$

$$\int \csc^m(x) \csc(x) \cot(x) dx$$

Example: $\int \sin^2(3x) dx$

Example: $\int \cos^4(x) dx$

Example: $\int \sin^5(2x) dx$

Example: $\int \sin^4(3x) \cos^3(3x) dx$

Example: $\int \sec^4(x) dx$

Example: $\int \tan^4(x) \sec^4(x) dx$

Example: $\int \tan^5(x) \sec^3(x) dx$

Example: $\int \sec(x) dx$

Example: $\int \sec^3(x) dx$

Example: $\int \cot^2(x) \csc^2(x) dx$