

$\frac{7.2}{1/2}$

Ex 1: $\int \sin^3(x) dx$

$$\int (1 - \cos^2(x)) \cdot \sin(x) dx$$

$$\text{Let } u = \cos(x)$$

$$du = -\sin(x) dx$$

want only 1 sine or 1 cosine.

Ex 2: $\int \sin^9(x) \cos^2(x) dx$

$$= \int \sin^8(x) \cos^2(x) \cdot \sin(x) dx$$

$$= \int (1 - \cos^2(x))^4 \cos^2(x) \cdot \sin(x) dx$$

Ex 3: $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos^2(x) dx$

$$= \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{1 + \cos(2x)}{2} dx$$

Half-Angle Formulas

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

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

Ex 4: $\int \cos^4(t) dt$ in groups.

ODD vs. Even Powers.

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$$\underline{\text{Ex 5:}} \quad \int \tan^3(x) dx$$

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

$$= \int [\tan(x) \sec^2(x) - \tan(x)] dx$$

↑

Substitute.

$$\underline{\text{Ex 6:}} \quad \int \sec^3(x) dx$$

$$u = \sec^2(x)$$

$$dv = \sec^2(x) dx$$