7.2 Videos Guide

7.2a

Exercise:

Evaluate the integral.

- $\int \sin^3 \theta \cos^4 \theta \ d\theta$

- Pythagorean Identities
  - $\sin^2 \theta + \cos^2 \theta = 1$
  - $\tan^2 \theta + 1 = \sec^2 \theta$
  - $1 + \cot^2 \theta = \csc^2 \theta$

7.2b

Exercise:

Evaluate the integral.

- $\int_0^{\pi} \sin^2 t \cos^4 t \ dt$

- Power-reducing formulas
  - $\cos^2 \theta = \frac{1}{2}(1 + \cos 2\theta)$
  - $\sin^2 \theta = \frac{1}{2}(1 - \cos 2\theta)$
- The double-angle formula
  $\sin 2\theta = 2 \sin \theta \cos \theta$

Exercises:

Evaluate the integral.

7.2c

- $\int \frac{\sin^2(1/t)}{t^2} \ dt$
- $\int \tan^2 x \cos^3 x \ dx$

7.2d

- $\int x \sin^3 x \ dx$

7.2e

- $\int_0^{\pi/4} \sec^6 x \tan^6 x \ dx$
- $\int \tan^5 x \sec^3 x \ dx$

7.2f

- Useful strategies
  - For $\int \sin^{m}\theta \cos^{n}\theta \ d\theta$:
    - Odd power
      → that's du
    - Even powers
      → power-reducing formula
  - For $\int \tan^{m}\theta \sec^{n}\theta \ d\theta$
    - Even power on secant
      → use $\sec^2\theta = du$
    - Odd power on tangent
      → use $\sec\theta \tan\theta = du$

- Two useful integration rules
  - $\int \tan x \ dx = \ln|\sec x| + C$
  - $\int \sec x \ dx = \ln|\sec x + \tan x| + C$