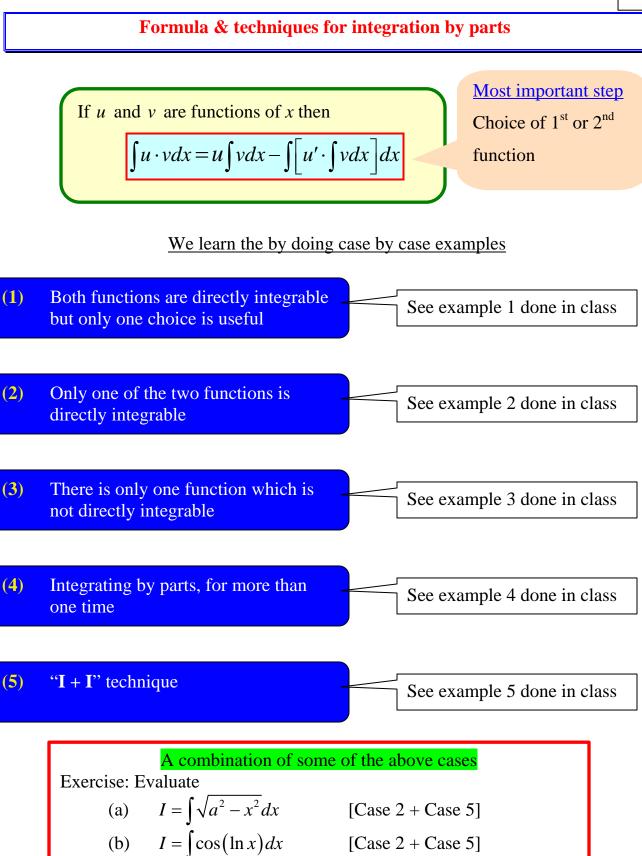
Learning outcomes

After completing this section, you will inshaAllah be able to

- 1. learn the method of integration by parts
- 2. apply integration by parts to prove reduction formulas for integration of some functions
- 3. evaluate integrals using reduction formulas

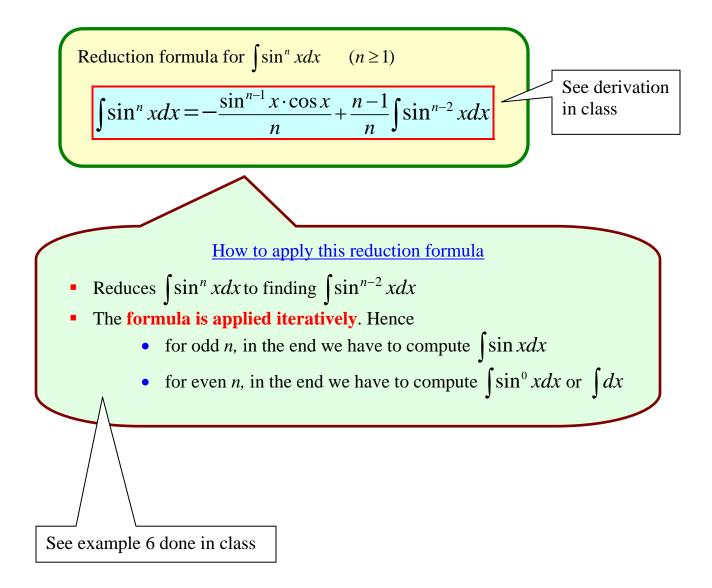


^{7.1&}lt;sub>2</sub>

Reduction formulas (An application of integration by parts)

Reduction formula

A formula that expresses an integral involving a power of a function in terms of integral with smaller powers of the same function



Reduction formulas (continued)

Reduction formula for
$$\int \cos^n x dx$$
 $(n \ge 1)$

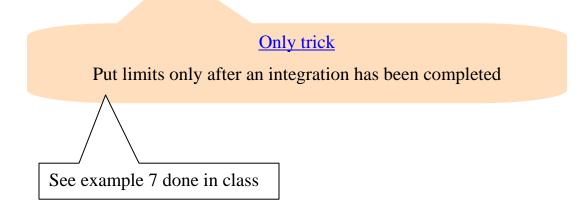
$$\int \cos^n x dx = \frac{\cos^{n-1} x \cdot \sin x}{n} + \frac{n-1}{n} \int \cos^{n-2} x dx$$
Derivation similar to the formula done above

Reduction formula for
$$\int \sec^n x dx$$
 $(n \ge 2)$
$$\int \sec^n x dx = \frac{\sec^{n-2} x \cdot \tan x}{n-1} + \frac{n-2}{n-1} \int \sec^{n-2} x dx$$
See derivation in class

Exercise Evaluate $\int \sec^4 x dx$

7.1₄

Evaluating Definite Integrals (using integration by parts)



End of Section 7.1