Reading Questions 9

Section 7.2 : Example 1

1. The derivative of $f(x)g(x)$ is $f'(x)g(x) + f(x)g'(x)$.
2. Suppose I tell you that $\int xe^x\,dx = xe^x - e^x + C$. How can you verify this claim?

Section 7.2 Integration by Parts (Part 1)

Introduction

Theorem: Integration by parts

$$\int f'(x)g(x)\,dx = f(x)g(x) - \int f(x)g'(x)\,dx$$

or

$$\int u'v = uv - \int uv'$$

P 1. Use integration by parts to find $\int x\cos(x)\,dx$.

P 2. Find $\int x^2\ln(x)\,dx$.

P 3. Use integration by parts to find $\int x^2e^{3x}\,dx$. Be sure to write down u and v.

Going in circles

P 4. Find $\int \sin^2(x)\,dx$. Hint: You might find yourself going in circles.

P 5. Find $\int e^x\sin(x)\,dx$.