

Example #2: $\int (x^3 + x)\cos(2x)dx$

Problem Set #7: Integrate each of the following using the tabular method for integration by parts.

1) $\int x^3 \sin x dx$

2) $\int t^2 e^{-3t} dt$

3) $\int 2xe^{-x} dx$

4) $\int x^2 \cos 3x dx$

5) $\int (4x^2 - 1) \cos 2x dx$

6) $\int (x^2 - 5x) e^x dx$

7) $\int x^3 e^{4x} dx$

8) $\int x^2 \sin 5x dx$

Answer Key:

1) $-x^3 \cos x + 3x^2 \sin x + 6x \cos x - 6 \sin x + C$

2) $-\frac{1}{3} t^2 e^{-3t} - \frac{2}{9} t e^{-3t} - \frac{2}{27} e^{-3t} + C$

3) $-2x e^{-x} - 2e^{-x} + C$

4) $\frac{1}{3} x^2 \sin(3x) + \frac{2}{9} x \cos(3x) - \frac{2}{27} \sin(3x) + C$

5) $\frac{1}{2} (4x^2 - 1) \sin 2x + 2x \cos 2x - \sin 2x + C$

6) $(x^2 - 5x)e^x - (2x - 5)e^x + 2e^x + C$

7) $\frac{1}{4} x^3 e^{4x} - \frac{3}{16} x^2 e^{4x} + \frac{3}{32} x e^{4x} - \frac{3}{128} e^{4x} + C$

8) $-\frac{1}{5} x^2 \cos 5x + \frac{2}{25} x \sin 5x + \frac{2}{125} \cos 5x + C$