

## Solution for Problem 2

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Make the substitution  $u = x^3$ ,  $du = 3x^2 dx$

$$\int x^5 e^{x^3} dx = \frac{1}{3} \int u e^u du \quad (6 \text{ points})$$

Then proceed to integrate by parts,

$$\frac{1}{3} \int u e^u du = \frac{1}{3} u e^u - \frac{1}{3} \int e^u du \quad (5 \text{ points})$$

$$= \frac{1}{3} u e^u - \frac{1}{3} e^u + c \quad (5 \text{ points})$$

Substitute back  $u = x^3$ ,

$$= \frac{1}{3} x^3 e^{x^3} - \frac{1}{3} e^{x^3} + c \quad (4 \text{ points})$$