

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Evaluate $\int x e^x dx$.

$$u = x \quad v = e^x$$

$$du = 1 \quad dv = e^x$$

$$\int x e^x dx = u \cdot v - \int v du$$

$$\int x e^x dx = x e^x - \int e^x$$

$$\int x e^x dx = \underline{x e^x - e^x + C}$$

Good

2. Evaluate $\int x^2 \ln x dx$.

$$u = \ln x \quad v = \frac{x^3}{3}$$

$$du = \frac{1}{x} \quad dv = x^2$$

$$\frac{x^3}{3} \ln x - \int \frac{x^3}{3} \cdot \frac{1}{x} dx$$

$$\frac{x^3}{3} \ln x - \int \frac{x^2}{3} dx$$

$$\boxed{\frac{x^3}{3} \ln x - \frac{x^3}{9} + C}$$

Great

$$\int u dv = u \cdot v - \int v du dx$$