

$$\int [\ln(x)]^3 dx \quad u = [\ln(x)]^3 \quad dv = dx$$

$$du = 3[\ln(x)]^2 \cdot \frac{1}{x} dx \quad v = x$$

$$= x[\ln(x)]^3 - \int 3[\ln(x)]^2 dx \quad u = 3[\ln(x)]^2 \quad dv = dx$$

$$du = 6 \ln(x) \cdot \frac{1}{x} dx \quad v = x$$

$$= x[\ln(x)]^3 - \left[3x[\ln(x)]^2 - \int 6 \ln(x) dx \right]$$

$$= x[\ln(x)]^3 - 3x[\ln(x)]^2 + \int 6 \ln(x) dx$$

$$u = 6 \ln(x) \quad dv = dx$$

$$du = \frac{6}{x} dx \quad v = x$$

$$= x[\ln(x)]^3 - 3x[\ln(x)]^2 + 6x \ln(x) - \int 6 dx$$

$$= x[\ln(x)]^3 - 3x[\ln(x)]^2 + 6x \ln(x) - 6x + C$$