

$$\int x^3 \ln x \, dx$$

Segui il tuo corso, e lascia dir le genti!

$$(uv)' = u'v + v'u$$

$$S(uv)' = Su'v + Sv'u$$

$$uv = Su'v + Sv'u$$

$$Su'v = uv - Sv'u$$

$$\int u \, dv = uv - \int v \, du$$

$$\begin{aligned} Sx^3 \ln(x) \, dx &= \ln x \cdot x^4/4 - S(x^4/4 \cdot dx/x) = \\ &= \ln x \cdot x^4/4 - S(x^3 dx/4) = \\ &= \ln x \cdot x^4/4 - x^4/16 + C = \end{aligned}$$

$$u = \ln x$$

$$dv = x^3 dx$$

$$v = Sdv = Sx^3 dx = x^4/4$$

$$du = d(\ln x) = dx/x$$

$$\begin{aligned} Sx^3 \ln(x) \, dx &= x^3(x \ln x - x) - S((x \ln x - x)3x^2 dx) = \\ &= x^3(x \ln x - x) - 3(Sx^3 \ln x dx) + S3x^3 dx = \\ &= x^3(x \ln x - x) - 3(Sx^3 \ln x dx) + 3x^4/4 + C \end{aligned}$$

$$Sx^3 \ln(x) \, dx = u$$

$$u = x^3(x \ln x - x) - 3u + 3x^4/4 + C$$

$$u = (x^3(x \ln x - x) + 3x^4/4 + C)/4 =$$

$$= (x^4 \ln x - x^4 + 3x^4/4 + C)/4 =$$

$$= x^4 \ln x/4 - x^4/4 + 3x^4/16 + C/4 =$$

$$= x^4 \ln x/4 - x^4/16 + C^*$$

$$u = x^3$$

$$du = 3x^2 dx$$

$$dv = \ln(x) \, dx$$

$$v = S \ln(x) \, dx = ek - S(kde) = x \ln x - S(x dx/x) =$$

$$= x \ln x - Sdx = x \ln x - x$$

$$e = \ln(x)$$

$$dk = dx$$

$$k = x$$

$$de = dx/x$$