

46. $u = \ln(4 + x^2)$, $du = \frac{2x}{4 + x^2} dx$, $dv = dx$, $v = x$

$$\begin{aligned}\int \ln(4 + x^2) dx &= x \ln(4 + x^2) - \int \frac{2x^2}{4 + x^2} dx \\ &= x \ln(4 + x^2) - 2 \int \left(1 - \frac{4}{4 + x^2}\right) dx \\ &= x \ln(4 + x^2) - 2 \left(x - \frac{4}{2} \arctan \frac{x}{2}\right) + C \\ &= x \ln(4 + x^2) - 2x + 4 \arctan \frac{x}{2} + C\end{aligned}$$

So, $\int_0^1 \ln(4 + x^2) dx = \left[x \ln(4 + x^2) - 2x + 4 \arctan \frac{x}{2} \right]_0^1 = \left(\ln 5 - 2 + 4 \arctan \left(\frac{1}{2} \right) \right) \approx 1.464$.