

問 (1) より

$$\begin{aligned} I &= \int \frac{(x-1)^2}{(x-1)^3} dx \\ &+ 4 \int \frac{x-1}{(x-1)^3} dx + 3 \int \frac{dx}{(x-1)^3} \\ &= \log |x-1| - \frac{4}{x-1} - \frac{3}{2(x-1)^2} + C \end{aligned}$$