

(N3) C-?

$$f_g(x) = \begin{cases} C x^{-3}, & x \in [1, +\infty) \\ 0, & \text{where} \end{cases}$$

1.) $f_g(x) \geq 0 \Rightarrow C \geq 0$

2.) $\int_{-\infty}^{+\infty} f_g(x) dx = 1$

$$\int_{-\infty}^{+\infty} C x^{-3} dx = C \int_1^{+\infty} x^{-3} dx = - \frac{C}{2x^2} \Big|_1^{+\infty} = \frac{C}{2}$$

$$\frac{C}{2} = 1 \Rightarrow C = 2$$

Answer: $C = 2$