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Teórico - Taller 4

① $$f(x) = \begin{cases} \dfrac{x^2}{3} & -1 \leq x \leq 2 \\[2mm] 0 & \text{en otro caso} \end{cases} \Bigg\}$$ función de densidad

a) hallar $P(0 < X \leq 1)$

$$P(0 < X \leq 1) \approx \int_0^1 f(x)\,dx$$

$$P(0 < X \leq 1) = \int_0^1 \frac{x^2}{3}\,dx$$

$$P(0 < X \leq 1) = \left.\frac{x^3}{3 \cdot 3}\right|_0^1$$

$$P(0 < X \leq 1) = \frac{1}{9}(1^3 - 0^3)$$

$$\boxed{P(0 < X \leq 1) = \frac{1}{9}}$$

b) hallar $P(1 < X \leq 2)$

$$P(1 < X \leq 2) \approx \int_1^2 f(x)\,dx$$

$$P(1 < X \leq 2) = \int_1^2 \frac{x^2}{3}\,dx$$

$$P(1 < X \leq 2) = \left.\frac{x^3}{3 \cdot 3}\right|_1^2$$

$$P(1 < X \leq 2) = \frac{1}{9}(2^3 - 1^3)$$

$$P(1 < X \leq 2) = \frac{1}{9}(8 - 1)$$

$$\boxed{P(0 < X \leq 1) = \frac{7}{9}}$$