

Ex

$$X \sim \mathcal{E}(5)$$

$$f_x : x \rightarrow \begin{cases} 5e^{-5x} & \text{if } x \geq 0 \\ 0 & \text{if } x < 0 \end{cases}$$

$$\begin{aligned} * P(2 \leq X \leq 4) &= \int_2^4 f_x(x) dx \\ &= \int_2^4 5e^{-5x} dx \\ &= \left[ -e^{-5x} \right]_2^4 \\ &= -e^{-20} + e^{-10} \\ &= \dots \end{aligned}$$

$$\begin{aligned} * P(-2 < X < +\infty) &= \int_{-2}^{+\infty} f_x(x) dx \\ &= \int_{-2}^0 0 dx + \int_0^{+\infty} 5e^{-5x} dx = \left[ -e^{-5x} \right]_0^{+\infty} = 1 - e^{-\infty} \\ &= \dots \end{aligned}$$