Media variabilei aleatoare exponenţiale este dată de

$$\begin{aligned}
M(X) &= \int_{-\infty}^{\infty} x f(x) dx \\
&= \int_{0}^{\infty} x \left(\lambda e^{-\lambda x}\right) dx \\
&= \int_{0}^{\infty} x \left(-e^{-\lambda x}\right)' dx \\
&= -x e^{-\lambda x}\Big|_0^{\infty} - \int_0^{\infty} -e^{-\lambda x} dx \\
&= \int_0^{\infty} e^{-\lambda x} dx \\
&= -\frac{e^{-\lambda x}}{\lambda}\Bigg|_0^{\infty} \\
&= -\frac{e^{-\infty}}{\lambda} - \left(-\frac{e^0}{\lambda}\right) \\
&= \frac{1}{\lambda},
\end{aligned}$$

iar dispersia este dată de

$$\begin{aligned}
\sigma^2(X) &= M\left[(X - M(X))^2\right] \\
&= \int_{-\infty}^{\infty} \left(x - \frac{1}{\lambda}\right)^2 (-\lambda e^{-\lambda x}) dx \\
&= \int_{-\infty}^{\infty} \left(x - \frac{1}{\lambda}\right)^2 (e^{-\lambda x})' dx \\
&= \left(x - \frac{1}{\lambda}\right)^2 e^{-\lambda x}\Bigg|_0^{\infty} - \int_0^{\infty} 2\left(x - \frac{1}{\lambda}\right) e^{-\lambda x} dx \\
&= \frac{1}{\lambda^2} - 2\int_0^{\infty} \left(x - \frac{1}{\lambda}\right)\left(-\frac{e^{-\lambda x}}{\lambda}\right)' dx \\
&= \frac{1}{\lambda^2} - 2\left(x - \frac{1}{\lambda}\right)\left(-\frac{e^{-\lambda x}}{\lambda}\right)\Bigg|_0^{\infty} + 2\int_0^{\infty} -\frac{e^{-\lambda x}}{\lambda} dx \\
&= \frac{1}{\lambda^2} - \frac{2}{\lambda^2} - \frac{2}{\lambda}\int_0^{\infty} e^{-\lambda x} dx \\
&= -\frac{1}{\lambda^2} - \frac{2}{\lambda}\left(-\frac{e^{-\lambda x}}{\lambda}\right)\Bigg|_0^{\infty} \\
&= -\frac{1}{\lambda^2} + \frac{2}{\lambda^2} \\
&= \frac{1}{\lambda^2}
\end{aligned}$$