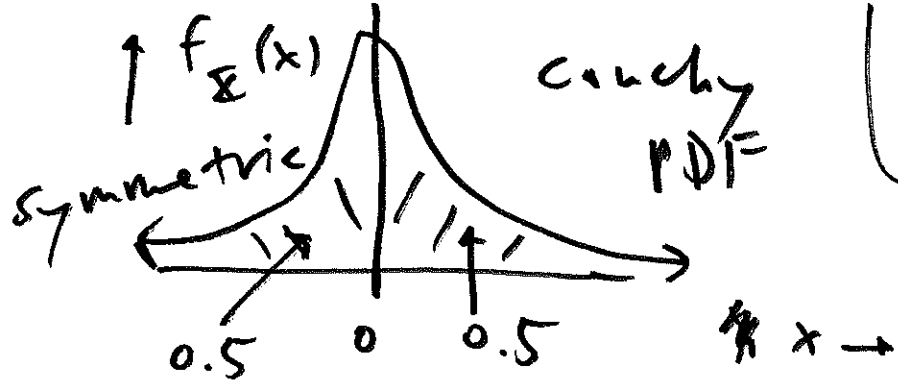


Discussion section 7

AMS 131
17 Jul 18
①



$E(X)$

doesn't exist

$$\int_{-\infty}^{\infty} x f_X(x) dx$$

$$\int_0^{\infty} x f_X(x) dx = +\infty$$

$$\int_{-\infty}^0 x f_X(x) dx = -\infty$$

• mean: doesn't exist

• median: 0 ← 50%

• mode: 0

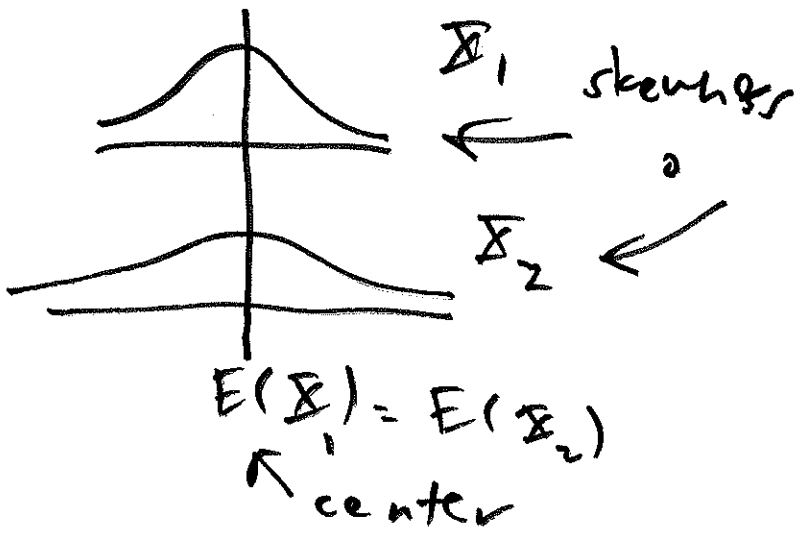
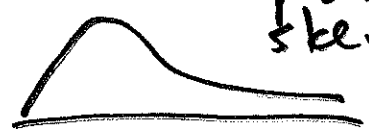
• variance: doesn't exist

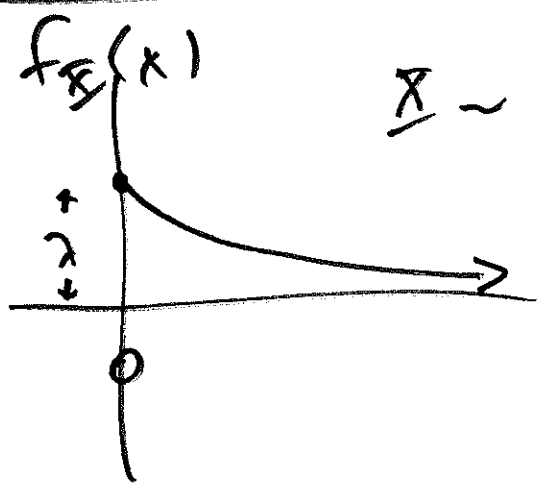
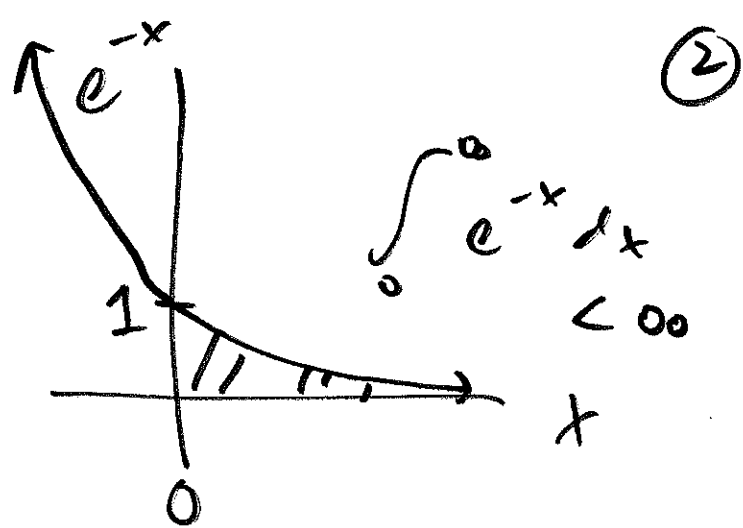
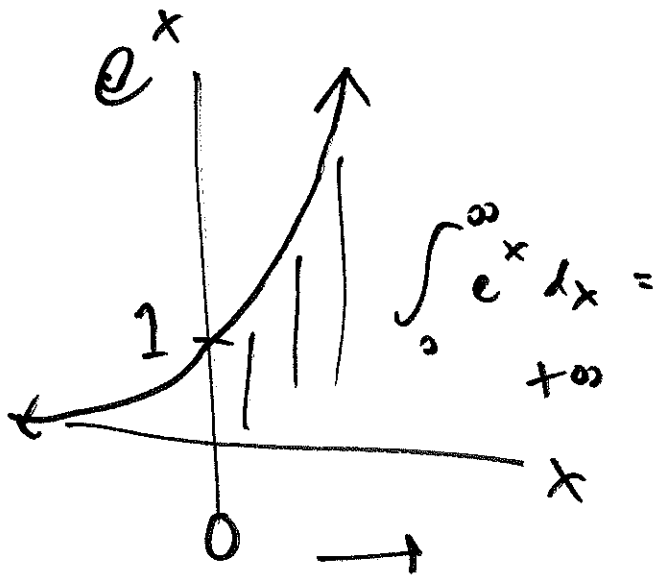
percentile
= 0.5 quantile
= 50%

point of symmetry: 0

spread

but $V(X_2) > V(X_1)$
positively skewed





$X \sim \text{Exponential}(\lambda)$

positively skewed \leftrightarrow

long right-hand tail

$$\text{skewness}(X) = E \left(\frac{X - \mu_X}{\sigma_X} \right)^3$$

$$= E \left(\frac{X - \frac{1}{\lambda}}{\frac{1}{\lambda}} \right)^3 = E \left(\lambda X - 1 \right)^3$$