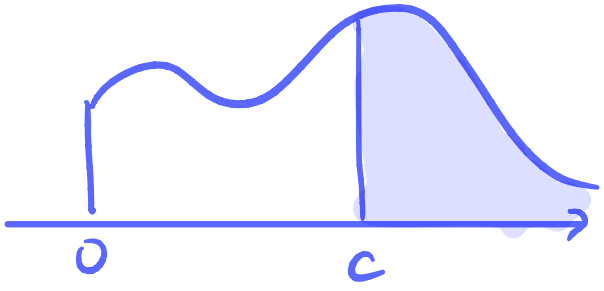
DIS 11B

MARKOV'S INEQUALITY

$$P(X \geq c) \leq \frac{E[X]}{c}$$

for nonnegative X

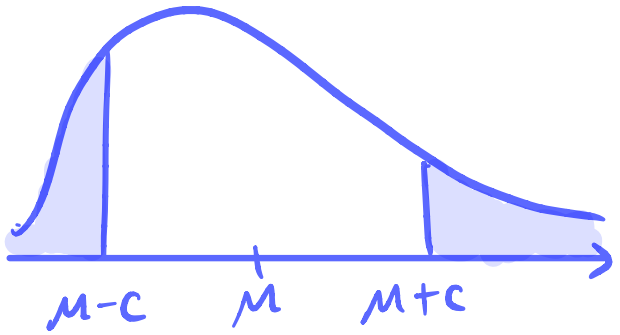
$(X \geq 0)$



CHEBYSHEV'S INEQUALITY

$$P(|X - E[X]| \geq c) \leq \frac{var(X)}{c^2}$$

for any X



→ this provides a tighter bound than Markov's!

→ can be derived from Markov's on $(X - E[X])^2$

LAW OF LARGE NUMBERS

for i.i.d. RVs $X_1, X_2, \dots, X_n$

(independent and identically distributed)

we let $S_n = X_1 + X_2 + \dots + X_n$. then:

$$P\left(\left|\frac{1}{n}S_n - E[X]\right| < \varepsilon\right) \to 1 \quad \text{as} \quad n \to \infty$$

for any ε!