

PROB #19 RY-2-20

MEAN OF SUM GETS MORE  
TIGHTLY CLUSTERED AS  $N$   
GROWS.

BINOMIAL  $N$  TOSSES OF  
FAIR COIN

$$N=1 \quad E[X] = \frac{1}{2} \quad \text{VAR}(X) = NPq$$

$\frac{1}{4}$

$$N=100 \quad E[\bar{X}_N] = \frac{1}{2}$$

$$\text{VAR}[\text{SUM}] = 100 \cdot \frac{1}{2} \cdot \frac{1}{2} = 25$$

$$\text{VAR}[\bar{X}_N] = \frac{25}{10000}$$

LESS BY A LOT.