4/17/19 C26

8.3 $X \sim U[-3,3]$

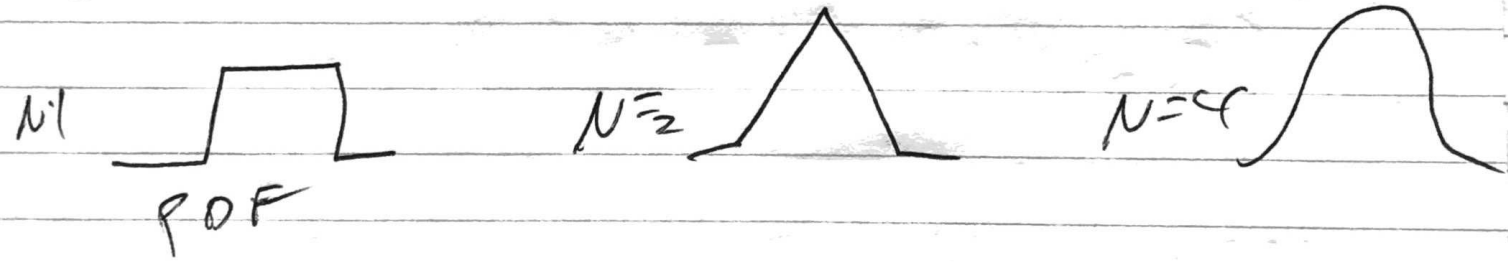
$\mu = 0 \quad \sigma^2 = \frac{(b-a)^2}{12} = 3$

X_{50} = MEAN OF 50.

$\mu_{50} = \sum \mu = 0$

$\sigma_{50}^2 = \sum \sigma^2 = 150$

X_{50} : NORMAL



MEAN OF 50: $\mu = 0$ ~~$\sigma_{150} = 12$~~

SUM OF 50 $\sigma^2 = 150$

MEAN OF 50 $\sigma^2 = \frac{150}{N^2} = \frac{3}{50} = .06$

$\sigma = .25$

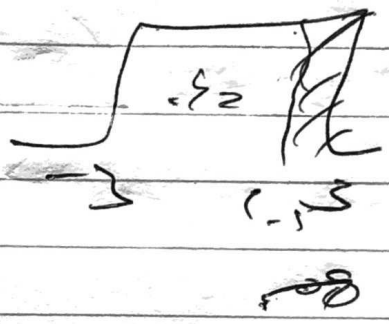
WANT P[MEAN NOT IN $(-.5, .5)$] =

$2 \cdot -2 \Rightarrow 2$

WANT $P[MAX \le 2.5]$

$= P[X \le 2.5]^{50}$

$= .92^{50}$



(c) $Y = X^2$

$$E[Y] = \frac{1}{6}\int_{-3}^{3} x^2\,dx = \frac{x^3}{9}\Big|_{-3}^{3} = \frac{18}{6} = 3$$

USE NORMAL APPROX

$$E[Y^2] = \frac{1}{6}\int_{-3}^{3} x^4\,dx = \frac{x^5}{5}\Big|_{-3}^{3} = \frac{2}{5}\cdot\frac{243}{6} = \frac{100}{6} = 17$$

$VAR[Y] = E[Y^2] - (E[Y])^2 = 17 - 9 = 8$

Y IS APPROX NORMAL $\mu = 3$, $\sigma^2 = 8$

$PROB[Y > 3] = \frac{1}{2}$