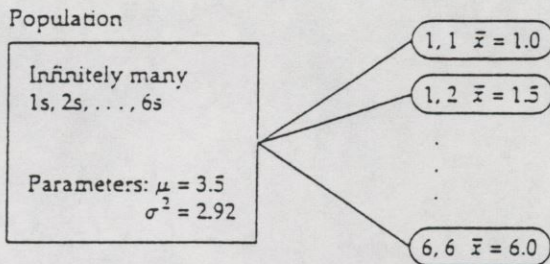
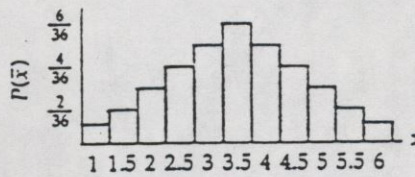
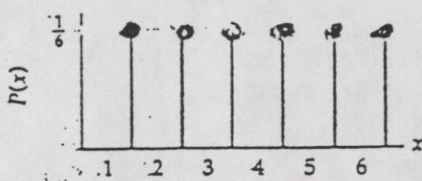


Central Limit Theorem In Action



All Samples of Size 2 and Their Means

SAMPLE	\bar{x}	SAMPLE	\bar{x}	SAMPLE	\bar{x}
1, 1	1.0	3, 1	2.0	5, 1	3.0
1, 2	1.5	3, 2	2.5	5, 2	3.5
1, 3	2.0	3, 3	3.0	5, 3	4.0
1, 4	2.5	3, 4	3.5	5, 4	4.5
1, 5	3.0	3, 5	4.0	5, 5	5.0
1, 6	3.5	3, 6	4.5	5, 6	5.5
2, 1	1.5	4, 1	2.5	6, 1	3.5
2, 2	2.0	4, 2	3.0	6, 2	4.0
2, 3	2.5	4, 3	3.5	6, 3	4.5
2, 4	3.0	4, 4	4.0	6, 4	5.0
2, 5	3.5	4, 5	4.5	6, 5	5.5
2, 6	4.0	4, 6	5.0	6, 6	6.0



$$\begin{aligned}
 \mu_{\bar{x}} &= E(\bar{x}) \\
 &= \sum \bar{x} \cdot p(\bar{x}) \\
 &= 1.0 \left(\frac{1}{36} \right) + 1.5 \left(\frac{2}{36} \right) + \dots + 6.0 \left(\frac{1}{36} \right) \\
 &= 3.5
 \end{aligned}$$

and the variance of \bar{x} ,

$$\begin{aligned}
 \sigma_{\bar{x}}^2 &= V(\bar{x}) \\
 &= \sum (\bar{x} - \mu_{\bar{x}})^2 \cdot p(\bar{x}) \\
 &= (1.0 - 3.5)^2 \left(\frac{1}{36} \right) + (1.5 - 3.5)^2 \left(\frac{2}{36} \right) + \dots + (6.0 - 3.5)^2 \left(\frac{1}{36} \right) \\
 &= 1.46
 \end{aligned}$$