A

Probability and statistic.

Section 5.3.

38. a. pmf:

T_0	0	1	2	3	4
$P(T_0)$	0.04	0.2	0.37	0.3	0.09

b. $\mu_{T_0} = 0\times0.04 + 1\times0.2 + 2\times0.37 + \cdots + 4\times0.09$

$= 2.2$

$\mu = 0\times0.2 + 1\times0.5 + 2\times0.3 = 1.1$

$\mu_{T_0} = 2\mu$.

小P

c. $\sigma_{T_0}^2 = 0.98$ $\sigma^2 = 0.49$. $\sigma_{T_0}^2 = 2\sigma^2$

41. a.

$\bar{x}$	1	1.5	2	2.5	3	3.5	4
$P(\bar{x})$	0.16	0.24	0.25	0.2	0.1	0.04	0.01

b. $P(\bar{x} \le 2.5) = 0.16 + 0.24 + 0.25 + 0.2 = \cancel{0.67}\ 0.85$

c.

R	0	1	2	3
$P(R)$	0.3	0.4	0.22	0.08

d. $p(\bar{x} \le 1.5) \Rightarrow P(X_1+X_2+X_3+X_4 \le 6) =$

$P(\bar{x} \le 1.5) = 0.4^4 + C_4^1 0.3\times0.4^3 + C_4^2 0.3^2\times0.4^2 + C_4^1 0.2\times0.4^3$

$= 0.24$

Section 5.4.

46. a. $E\bar{x} = \mu_{\bar{x}} = \mu = 12$

$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = 0.01$

b. $E\bar{x} = \mu = 12$

$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = 0.005$

c. part b is likely to be within 0.01 cm of 12 as it has a smaller variance.

51. On day 1. $n=5$. $\mu_{\bar{x}} = \mu = 10$ $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

$P(\bar{x} \le 11) = \phi\left(\frac{11-\mu_{\bar{x}}}{\sigma_{\bar{x}}}\right) = 0.8686$.

On day 2 $n=6$

$P(\bar{x} \le 11) = \phi\left(\frac{11-\mu_{\bar{x}}}{\sigma_{\bar{x}}}\right) = 0.8888$.

$P = 0.8686 \times 0.8888 = 0.7720$

55. a. $\mu = 50$. $\sigma = \sqrt{50}$

$P(34.5 \le \bar{x} \le 70.5) = -\phi\left(\frac{34.5-50}{\sqrt{50}}\right) + \phi\left(\frac{70.5-50}{\sqrt{50}}\right)$

$= 0.8882$.

b. $\mu = 250$ $\sigma_{\bar{x}} = \frac{\sqrt{n}}{\sigma}$

$P(225 \le \bar{x} \le 275) = -\phi\left(\frac{225-250}{\sigma_{\bar{x}}}\right) + \phi\left(\frac{275-250}{\sigma_{\bar{x}}}\right)$

$= 0.8926$.

58. (a) $E = \sum_{i=1}^{3} a_i \mu_i = 87850$.

$V = \sum_{i=1}^{n} a_i^2 \sigma_i^2 = 19100116$.

(b) they will still be ~~cros~~ correct.

70. a. $E(Y_i) = 0.5$.

$E(W) = \sum a_i \mu_i = \sum i \cdot E(Y_i)$

$= \frac{n(n+1)}{4}$

(b) $V(Y) = E(Y^2) - [E(Y)]^2$

$= 0.5 - 0.25$

$= 0.25$

$V(W) = \sum a_i^2 \sigma_i^2 = \sum i^2 \cdot V(Y_i)^2$

$= \frac{n(n+1)(2n+1)}{24}$

13. (a) normal distribution.

(b) ~~As~~ $\bar{x}$ and $\bar{y}$ are likely to be normal distribution.

$\bar{x}-\bar{y}$ can also be seem as a normal distribution with.

(c) $\mu_{\bar{x}-\bar{y}} = 5$. $V(\bar{x}-\bar{y}) = V\bar{x} + V\bar{y}$

$\sigma_{\bar{x}} = \frac{8}{\sqrt{40}}$ $\sigma_{\bar{y}} = \frac{6}{\sqrt{35}}$ $\sigma(\bar{x}-\bar{y}) = 1.621$

$P(-1 \le \bar{x}-\bar{y} \le 1) = -\phi\left(\frac{-1-5}{1.621}\right) + \phi\left(\frac{1-5}{1.621}\right)$

$= 0.0068$

d $P(\bar{x}-\bar{y} \ge 10) = 1-\phi\left(\frac{10-5}{1.621}\right) = 0.001$

There's no ~~doub~~ doubt that $\mu_1 - \mu_2 = 5$.