ch5: Extra Problems Solution

1) $P = \frac{2}{6} = \frac{1}{3} \Longrightarrow q = \frac{2}{3}$

$n = 60$

$$\mu = \frac{1}{3}(60) = 20$$

$$\sigma = \sqrt{\frac{1}{3} \cdot \frac{2}{3} \cdot 60} = 3.65$$

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2) $P = \frac{\text{Sum} > 9}{36} = \frac{6}{36} = \frac{1}{6}$

$q = \frac{5}{6}$

$n = 60 \longrightarrow \mu = 60\left(\frac{1}{6}\right) = 10$

$$\sigma = \sqrt{\frac{1}{6} \cdot \frac{5}{6} \cdot 60} = 2.887$$

<u>Note</u>: Sum > 9:

6 ways $\longrightarrow$ 55, 46, 64
65, 56, 66

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3) $\mu = 3.6 \quad , \quad \sigma = 0.75$

$P(X \geq 2.3)$

$$Z = \frac{2.3 - 3.6}{0.75} = -1.73$$

$P(Z \geq -1.73) = 0.9582$ from Table

4) $\mu = 400, \quad \sigma = 40$

$$X = 360 \longrightarrow Z = \frac{360-400}{40} = -1$$

$$X = 410 \longrightarrow Z = \frac{410-400}{40} = +0.25$$

$$P(360 \leq X \leq 410) \longrightarrow P(-1 \leq Z \leq +0.25)$$

use Table $P = 0.44$

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5) $\mu = 100, \quad \sigma = 15$

$$P(X \leq 105)$$

$$X = 105 \longrightarrow Z = \frac{105-100}{15} = 0.33$$

$$P(Z \leq 0.33) \approx 0.6293$$

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6) $P(H) = 0.65, \quad q = 0.35, \quad n = 400$

$$\mu_H = 400(0.65) = 260$$

$$\mu_T = 400(0.35) = 140$$

$$\sigma_H = \sigma_T = \sigma = \sqrt{400(0.65)(0.35)} = 9.54$$

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7) 2N, 6Q $\longrightarrow$ 2 Selected

	X	P	X·P
2 N	10	$\frac{C(2,2)}{C(8,2)} = \frac{1}{28}$	$10/28$
2 Q	50	$\frac{C(6,2)}{C(8,2)} = \frac{15}{28}$	$750/28$
1N, 1Q	30	$\frac{C(2,1)\cdot C(6,1)}{C(8,2)} = \frac{12}{28}$	$360/28$
			40¢ = 0.40 Dollars

8) $n = 1000, \quad P_T = 0.75, \quad P_H = 0.25$

$$\mu_T = 1000(0.75) = 750$$

$$\longrightarrow \mu_H = 1000(0.25) = 250$$

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9) $P(H) = 0.65 \qquad P(T) = 0.35, \quad n = 300$

$$\mu = 300(0.35) = 105$$

$$\sigma = \sqrt{300(0.65)(0.35)} = 8.261$$

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10) $P(Z > 0.1)$

from Table $\quad P = 1 - 0.5398 = 0.4602$

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11) $\mu = +100(0.02) + 10(0.2) - 5(0.4) = \$2$

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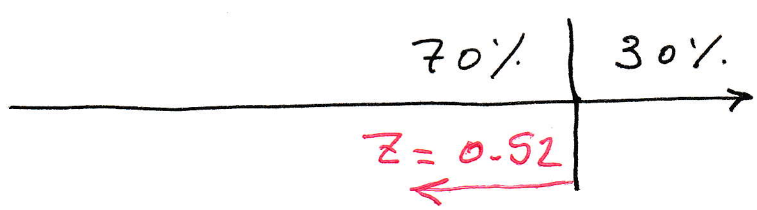
12) $\mu = 100, \quad \sigma = 15$



Nearest to 70% is 0.6985 where $Z = 0.52$

(use the Table Backward)

$$0.52 = \frac{X - 100}{15} \Rightarrow X = 107.8 \approx 108$$

$$\left(Z = \frac{X - \mu}{100}\right)$$