4.4

(2)

$$P(X = x) = p(x) = \frac{\binom{R}{x}\binom{N-R}{n-x}}{\binom{N}{n}}$$

$$\text{Let } N = 30, R = 4, n = 10$$

$$p(x) = \frac{\binom{4}{x}\binom{26}{10-x}}{\binom{30}{10}}$$

a $x = 2$

$$p(x) = \frac{\binom{4}{x}\binom{26}{10-x}}{\binom{30}{10}}$$

$$p(3) = \frac{\binom{4}{3}\binom{26}{10-3}}{\binom{30}{10}}$$

$$= 0.312$$

b $x = 0$

$$p(x) = \frac{\binom{4}{x}\binom{26}{10-x}}{\binom{30}{10}}$$

$$p(0) = \frac{\binom{4}{0}\binom{26}{10-0}}{\binom{30}{10}}$$

$$= 0.178$$

4.5

(2)

a .7123

b $.0197 - .0017 = .018$

c $.5279 - .1401 = .388$

(4)

$$P(X = x) = p(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{-(x-\mu)^2}{2\sigma^2}}$$

with $\sigma^2 = 9$and $\mu = 2$

a $P(X \geq 2) \Rightarrow P(Z = 0) = .5$

b $P(1 \leq X < 7) \Rightarrow P(\frac{-1}{3} \leq Z < \frac{5}{3}) = 0.5818$

c $P(-2.5 \leq X \leq -1) \Rightarrow P(-1.5 \leq Z \leq -1) = .0919$

(6)

$$P(X = x) = p(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{-(x-\mu)^2}{2\sigma^2}}$$

with $\sigma = 29$ and $\mu = 822$

a the area in the table for .10 happens at a z-score of -3.08. using $Z = \frac{x-\mu}{\sigma}$ one would get $x = 732.68$

b with a depth of 780 one would get a z score of -1.45 making the area under the curve at that point is .0735 so with in the 10 percentile.

c $Z_1 = \frac{830-\mu}{\sigma} = .28, Z_2 = \frac{830-\mu}{\sigma} = .226$, the area under the curve between the two z-scores are 0.3853 meaning 38.5% of pits are between between 800 and 830 μm