STAT 515 Homework #2 — Mathew Houser

4.28 (b) $P(\text{at least } 3) = P(3)+P(4) = 0.06$

4.44 (a) $\mu = E(x) = x \cdot P(x) = 34.5$

$\sigma^2 = \Sigma(x-\mu)^2 \cdot p(x) = 174.75$

$\sigma = \sqrt{\sigma^2} = 13.219$

4.66 (a) $\mu = n \cdot p = 12.5 \quad \sigma^2 = npq = 6.25 \quad \sigma = \sqrt{npq} = 2.5$

4.76 (a) $p = 0.50 \quad n = 20 \quad P(\text{more than half}) = P(x \geq 11)$

$P(x) = \frac{20!(0.5)^x(0.5)^{20-x}}{x!(20-x)!} \Rightarrow P(x \geq 11) = 0.4119$

(b) $p = 0.70 \quad n = 20 \quad P(\text{more than half}) = P(x \geq 11)$

$P(x) = \frac{20!(0.7)^x(0.3)^{20-x}}{x!(20-x)!} = P(x \geq 11) = 0.95204$

4.101 (a) $x = 0, 1, 2 \quad P(x) = \frac{5^x e^{-5}}{x!} \rightarrow P(x < 3) = 0.12465$

(b) $E(x) = \mu_x = \lambda = 5$. During the peak hour we would expect to recieve 5 blocked calls.

5.4 (b) $P(20 < x < 30) = (30-20)/(30-10) = 0.50$

(d) $P(x \leq 10) = (10-10)/(30-10) = 0$

5.26 (a) $P(z > 1.46) = 0.0721$

(b) $P(z < -1.56) = 0.0594$

(d) $P(z > 1) = 0.1587$

5.38 (a) $z = \frac{120-105.3}{8} = 1.84 \rightarrow P(x > 120) = 0.0329$

(b) $P(100 < x < 110) = 0.4678$

$z_1 = \frac{100-105.3}{8} = -0.66 \quad z_2 = \frac{110-105.3}{8} = 0.59$

(c) $P(x < a) = 0.25 \Rightarrow z = -0.67 = \frac{a-105.3}{8} \Rightarrow a = 99.94$