MA 381 HW 9 Solutions

#1 (#1, pg. 266) Let X = travel time

$$P(\text{"on time"}) = P(X \le 23) = \int_{20}^{23} \frac{1}{7}\,dx = \frac{3}{7}.$$

#2 (#3, pg. 266)

$$E[X] = \frac{a+b}{2} = 2 \text{ pm}$$

$$\sigma_X^2 = \frac{(b-a)^2}{12} = 12$$

$$\Leftrightarrow \quad (b-a)^2 = 12^2$$

$$\Leftrightarrow \quad b - a = 12$$

Since 2 pm is mid-pt.,

a = 1:54 pm
b = 2:06 pm

#3 (#1, pg. 281)

Let X = # cures. X is binomial w/ $n = 50$, $p = 0.9$

$$P(\text{at least } 45) = P(X \ge 45)$$

$$\approx P(Y \ge 44.5)$$ where Y is normal w/ $\mu_Y = np = 45$, $\sigma_Y = \sqrt{np(1-p)} = 2.12$

$$P(Y \ge 44.5) = P(44.5 \le Y \le \infty)$$

$$= P\left(\frac{44.5-45}{2.12} \le Z \le \infty\right)$$

$$= \Phi(\infty) - \Phi(-0.24) = 1 - .4052 = \underline{.5948}$$