Problem 41

X: number of group 1 participants that complete the study
Y: number of group 2 participants that complete the study

$$P[X \geq 9 \cap Y < 9] + P[X < 9 \cap Y \geq 9]$$

$$2 \cdot P[X \geq 9 \cap Y < 9]$$ due to symmetry

$$2 \cdot P[X \geq 9] \cdot P[X < 9]$$ because X and Y have same distribution

$$2 \cdot P[X \geq 9] \cdot [1 - P(X \geq 9)]$$

$X \sim \text{Binomial}(n = 10, p = .8)$

$P(X = K) = \binom{n}{K} p^K \cdot (1-p)^{n-K}$

$$2 \cdot \left[\binom{10}{9}(.8)^9(.2) + (.8)^{10}\right] \cdot \left[1 - \binom{10}{9}(.8)^9(.2) - (.8)^{10}\right]$$ $P(X \geq 9) = P(X = 9) + P(X = 10)$

$2(.376)(1-.376) = .469$

E