HW 05 SOLUTIONS

Practice Problems

3.67

$$(0.7)^4(0.3) = 0.07203$$

3.71

(a)

$$P(Y > a) = \sum_{y=a+1}^{\infty} q^{y-1}p = pq^a \sum_{y=1}^{\infty} q^{y-1} = \frac{pq^a}{1-q} = q^a$$

(b) From part (a),

$$P(Y > a+b \mid Y > a) = \frac{P(Y > a+b)}{P(Y > a)} = \frac{q^{a+b}}{q^a} = q^b$$

(c)

$$P(Y > a+b \mid Y > a) = P(Y > b)$$

(d) The results in the past are not relevant to a future outcome (independent trials).

3.73

Let Y = number of accounts audited until the first with substantial errors is found.

(a)

$$P(Y = 3) = (0.12)(0.9)^2 = 0.009$$

(b)

$$P(Y \geq 3) = P(Y > 2) = (0.9)^2 = 0.81$$