**Solutions to Exercises for Chapter 9**

9.1.

a) *P*(*Y* 1) = .05 + .10 = .15

b) *P*(*Y* > 2) = .20 + .30 + .15 + .10 = .75

c) *P*(*Y* > –1) = 1.00

d) *P*(2 < *Y* < 6) = .20 + .30 + .15 = .65

e) *P*(*Y* = 4) = .30

f) *P*(*Y* < 1) = .05

9.2.

If you live (*P* = .99), the insurance company gets to keep the $600. If you die (*P* = .01), the company has to pay $20,000, but only loses $19,400 as $600 of the payout was yours …



Thus, for every policy the company sells like this one, the company can expect to make a profit of $400.

9.3.

*n* = 8 *p*=.25 *q* = .75

First, the entire solution for all possible outcomes, using the binomial expansion “by hand”:



















Now, the answer to the question:

 

Solving this problem with R:

#Eight Tosses of a Biased Coin

#Define the number of trials

n <- 8

#Define the probability of a success

p <- .25

#Define the vector of possible values

num.success <- 8:0

#Find the probability of each outcome

prob.success <- dbinom(num.success,n,p)

round(prob.success,5)

prob.ge.7 <- sum(prob.success[1:2])

prob.ge.7

The results:

> round(prob.success,5)

[1] 0.00002 0.00037 0.00385 0.02307 0.08652 0.20764 0.31146 0.26697 0.10011

> prob.ge.7 <- sum(prob.success[1:2])

> prob.ge.7

[1] 0.0003814697