

Statistics 23, Section 1, Homework # 6

Due: Thursday, October 7, 1999

4.28 (\$90,000)

4.30 b (6.5)

4.34 (-\$0.50)

B9: For the probability distribution:

x	-1	0	1	2
f(x)	0.4	0.3	0.2	0.1

find $E(X^2 - 1)$ by:

- (a) the formula $Eg(X) = \sum_x f(x)g(x)$ (0).
- (b) first finding the distribution of $Y = X^2 - 1$.

B10: An insurance company sells 1378 policies to cover bicycles against theft for one year. It costs \$300 to replace a stolen bicycle and the probability of theft is estimated at 0.06. Suppose there is no chance of more than one theft per individual.

- (a) Calculate the expected payout for each policy, to give a “break even” price for each policy. (\$18).
- (b) If 2 times the break even price in (a) is actually charged, what is the company’s expected profit per policy if the probability of theft is actually 0.08? (\$12).

4.39 a-c, calculate $\mu = EX$ only.

2.31

2.46 b, using Excel, and its “median” function. (30.10 million)

B11 For the distributions:

- (i) Binomial(30, 0.6)
- (ii) Binomial(35, 0.5)
- (iii) Binomial(20, 0.03)

- (a) Use Excel to find all of the medians ((i) 18 (ii) [17,18] (iii) 0)
Hint: for a suitable range of x values, calculate both $P\{X \leq x\}$ and $P\{X < x\}$.

2.46 c, d, e, but not the “mode” (mean = 32.6 mil., median = 33.8 mil., suggests left skewed)

B11 (b) Find the means for (i) – (iii) (Hint: $EX=np$) and use there comparison to the medians from part (a) to predict “symmetry vs. skewness”.

(c) Check your predictions in (b) by plotting the probability histograms.

B12 Calculate the standard deviation for the following lists and compare “qualitatively” in terms of “spread”:

(a) 1, 3, 3, 1 (1.15)

(b) -6, -4, -4, -6 (1.15)

(c) 1, 5, 5, 1 (2.31)

(d) 1, 1, 1, 1 (0)

4.22 b, c, (10.6, 3.25)

2.51 a, b