

MATH 110 – 9 DECEMBER 2009 – EXAM 3

Answer each of the following questions. Show all work, as partial credit may be given.

1. (8 pts. each) The number of persons waiting in a supermarket checkout line were counted every 5 minutes during an 8 hour period. The results are given below.

# in line	# of occurrences
0	8
1	28
2	46
3	14

- (a) Calculate the relative frequency distribution for these data.
- (b) Draw a histogram for the relative frequency distribution you found in part (a).
- (c) Find the sample mean \bar{x} for the data in the table.
2. (8 pts. each) The probability that an expert dart-thrower can hit the bullseye is $3/5$.
- (a) What is the probability that he hits the bullseye exactly 6 times in 8 throws?
- (b) What is the probability that he hits the bullseye *at least* 6 times in 8 throws?
3. (8 pts. each) The earnings (in dollars) of a player in a certain game of chance are given in the table below.

Earnings in dollars	Probability
-1	$1/16$
$-1/2$	$1/2$
$1/2$	$3/8$
1	$1/16$

- (a) Find the expected earnings of the player for each play of the game.
- (b) If this game were set up in a casino and 500 people played it on a given night, how much money would the casino expect to make from the game?
4. (8 pts. each) The probability distribution for the random variable X is given below.

k	$Pr(X = k)$
-1	.4
1	.3
2	.3

- (a) Find $E(X)$, the expected value of X .
- (b) Find the variance $Var(X)$ and the standard deviation $\sigma = \sqrt{Var(X)}$ of X .
- (c) Find the probability distribution for the random variable $Y = X^2$.