

Timed Expectations



Have Assignment out to go over

Deck of Cards

4 Suits

Colors

Values

Face Cards

In your journal, create a Frayer Model for Mutually Exclusive Events

Definition:	Illustration:
Examples:	Non-Examples:

A Frayer Model diagram consisting of a large rectangle divided into four quadrants by a vertical and a horizontal line. In the center of the rectangle is a white oval. The quadrants are labeled: top-left 'Definition:', top-right 'Illustration:', bottom-left 'Examples:', and bottom-right 'Non-Examples:'.

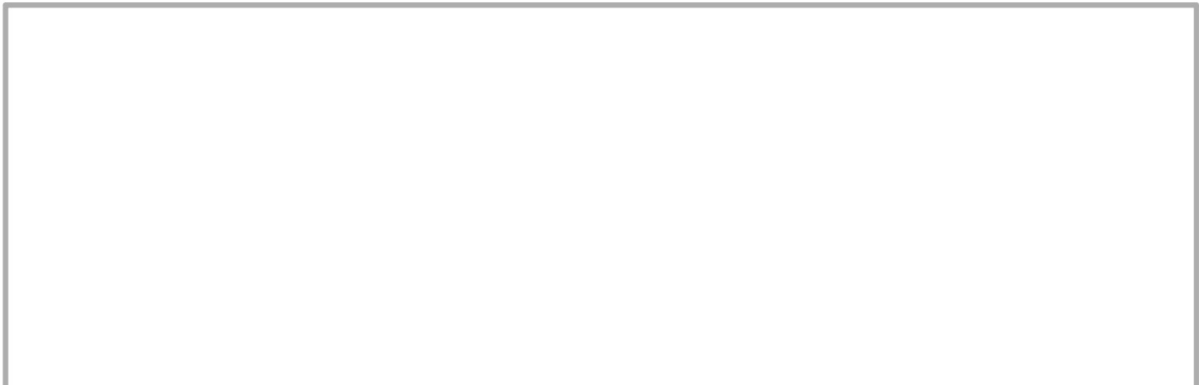
Probability Assignment #5

1. Are the following pairs of events mutually exclusive?
 - a) Living in Rock Hill and working in Charlotte.
 - b) Being a freshman and being a junior in high school.
 - c) Being a professor and being an author of a book.
 - d) Drawing a red card and drawing the ace of spades.
 - e) Drawing a face card and drawing the six of hearts from a normal deck of cards.
2. If the probabilities that Joan, Beverly and Evelyn will be elected secretary of a ski club are $\frac{1}{8}$, $\frac{2}{5}$, and $\frac{1}{3}$ respectively, find the probability that one of the three will be elected.
3. If the probabilities that John and Harry will be valedictorian of a high school class are $\frac{1}{4}$ and $\frac{3}{7}$ respectively, what is the probability that either John or Harry will be valedictorian?
4. Chris and Janet are among twenty girls who enter a tennis tournament. What is the probability that either one of these two girls will win the tournament?
5. In a drawer are six white gloves, four black gloves, and eight brown gloves. If a glove is picked at random, what is the probability that it will be either white or brown?
6. Find the probability that a person will throw 4, 8, and 10 on the first, second, and third tosses of a pair of dice.

- of a pair of dice.
7. A card is drawn from a standard deck of 52 cards, replaced, and a second card is drawn. What is the probability that both cards are tens?
 8. The probability that Joe will solve a certain problem is $\frac{3}{5}$, that Jane will solve it is $\frac{5}{6}$, and that Sam will solve it is $\frac{1}{4}$. What is the probability that Joe and Jane will solve it, and Sam will not solve it?
 9. A bag contains five green marbles, four yellow marbles, and nine white marbles. If two marbles are drawn in succession, and the first marble is not replaced before the second is drawn, what is the probability that:
 - a) the second marble is yellow, if the first marble drawn is green?
 - b) the second marble is white, if the first marble drawn is yellow?
 - c) both marbles are green?
 - d) both marbles are yellow?
 - e) both marbles are white?
 10. A box contains ten slips of paper. Three slips are marked with the letter G, two slips are marked M, and five slips are marked K. If two slips of paper are drawn in succession, and the first is not replaced before the second is drawn, what is the probability that:
 - a) the first slip is marked G, and the second is marked K?
 - b) the first slip is marked G, and the second is marked ~~M~~? M
 - c) the first is marked ~~G~~ M, and the second is marked G?
 - d) the first is marked K, and the second is marked G?
 - e) the first is marked ~~M~~ M, and the second is marked K?
 - f) the first slip is marked K, and the second slip is marked M?
 - g) both slips are marked G?
 - h) both slips are marked M?
 - i) both slips are marked K?

Expected Value

The sum of the probability of each possible outcome of the experiment multiplied by its payoff. It represents the average amount one expects to win per bet if bets with identical odds are repeated many times.



You receive an A 40% of the time, an B 20% of the time, a C 15% of the time, and a D the rest of the time. What grade can you expect to receive (A=4, B=3, C=2, & D=1)?

$$4 \cdot .40 + 3 \cdot .20 + 2 \cdot .15 + 1 \cdot .25 = 2.75$$

There is a lottery of 1000 tickets; every ticket costs \$1. The lottery has the following prizes: one ticket wins \$500, 5 tickets win \$50 and 20 tickets win a \$10 prize.

$$500*(1/1000) + 50*(5/1000) + 10*(20/1000) - 1*(974/1000) = - .024$$

Examples

1. A coin is flipped. Heads, you win \$1. Tails, you lose \$1.

a) What are the possible outcomes?

b) What are your expected winnings?

2. Again, a coin is flipped. Heads, you win \$1. Tails, you lose \$2.

a) What are the possible outcomes?

b) What are your expected winnings?

3. A quiz has 4 questions: a True-False question, 2 multiple choice questions each with 3 choices and a multiple choice question with 4 choices. If a student randomly guesses at each of the questions, what is the expected number of questions he will answer correctly?

Assignment
Probability Assignment #6
(Handout)

