

Week-In-Review #7 (7.2, 7.3, 7.4)

1. A pair of fair 6-sided dice are rolled and the outcomes on each die are recorded.
 - (a) Write an appropriate sample space for this experiment.
 - (b) Is this a uniform sample space? Why or why not?
 - (c) How many simple events are associated with this experiment?
 - (d) How many total events are associated with this experiment?
 - (e) Write the event, E , that a sum of less than 6 is rolled.
 - (f) Find $P(E)$.
 - (g) Find the probability that a product of 8 is rolled or a 5 is rolled on at least one of the dice.
 - (h) Find the probability that a sum of 8 is rolled or a double is rolled.
 - (i) Find the probability that a sum of 2 and at least one 3 is rolled.

2. You roll two fair five-sided dice (one red and one green). What is the probability that the
 - (a) Sum of the dice is 7?
 - (b) Red die shows a bigger number than the green die?
 - (c) Sum of the dice is odd and the green die shows a 2?
 - (d) Red die shows a 2 or the green die shows a 4?
 - (e) Number 3 is not rolled on either die?

3. You choose one letter at random from the word HALLOWEEN.
 - (a) Write a uniform sample space for this experiment and the corresponding probability distribution.
 - (b) Write a non-uniform sample space for this experiment and the corresponding probability distribution.

4. A chick is randomly chosen from a new box of multi-colored Peeps containing 3 yellow, 4 purple, 2 green, 1 red, and 6 pink chicks and its color is noted.
 - (a) Write a non-uniform probability distribution for this experiment.
 - (b) What is the probability that a green or red chick is chosen?
 - (c) What is the probability that a traditional yellow chick is not chosen?

5. Suppose $P(E) = 0.4$, $P(F) = 0.5$, and $P(E \cup F) = 0.6$. Calculate the following.

- (a) $P(E \cap F)$
- (b) $P(F^C)$
- (c) $P(E^C \cup F^C)$
- (d) $P(E \cap F^C)$

6. For Sunday dinner, the Smith family and the Jones family go out to eat. Twenty percent of the time the Smiths go to the Elite Diner. Thirty percent of the time the Joneses go to the Elite Diner. Twelve percent of the time both families go to the Elite Diner.

What is the probability that on any given Sunday,

- (a) At least one of the families goes to the Elite Diner?
- (b) Exactly one of the families goes to the Elite Diner?
- (c) Neither of the two families goes to the Elite Diner?

7. 300 students were recently surveyed. 200 of these students were taking MATH 141, 95 said they regularly use their cell phone in all of their classes, and 80 are not taking MATH 141 and also do not regularly use their cell phone during any of their classes. What is the probability that a randomly selected surveyed student

- (a) Regularly uses their cell phone in their MATH 141 class?
- (b) Does not regularly use their cell phone during their classes?

8. The students in a statistics class were surveyed concerning their eye color. The findings were gathered in the table below.

	Blue Eyes (B)	Green Eyes (G)	Brown Eyes (W)	Other (O)	Totals
Females (F)	15	8	25	3	51
Males (M)	10	5	12	7	34
Totals	25	13	37	10	85

For each question below, write the corresponding probability notation for the question being asked and then find the numerical answer.

What is the probability that a randomly selected surveyed statistics student

- Is female?
- Has blue eyes?
- Is female and has blue eyes?
- Is female or has blue eyes?
- Does not have green eyes?
- Is a male or does not have brown eyes?

9. A survey of 5902 adults revealed the following:

	Has seen ghost	Has not seen ghost	Total
Age 18-29	212	1313	1525
Age 30 or over	465	3912	4377
Total	677	5225	5902

Let Y = adult is under 30, V = adult is 30 or over,

G = adult has seen a ghost, N = adult has not seen a ghost

For each question below, write the corresponding probability notation for the question being asked and then find the numerical answer.

- What is the probability that a randomly selected adult has reportedly seen a ghost?
- What is the probability that a randomly selected adult is under 30 and has seen a ghost?
- What is the probability that a randomly selected adult is under 30 or has seen a ghost?

10. A bag contains 4 red disks, 7 green disks and 8 blue disks. Suppose a sample of 6 disks are selected at random. What is the probability that the sample contains

- (a) Exactly 3 red and 3 blue disks?
- (b) Exactly 5 green disks?
- (c) All the available red disks?
- (d) At least 2 blue disks?
- (e) No more than 1 green disk?
- (f) All disks of the same color?
- (g) Exactly 2 green or exactly 3 blue disks?

11. In order to use an ATM machine, you must have a 4-digit pin number. Suppose that to pick your pin, you number pieces of paper from 0 through 9 and place them in a bag. You then draw 4 pieces of paper from the bag, in succession, with replacement. The first number drawn becomes the first digit of your pin the second number drawn becomes the second digit, etc. What is the probability that your pin number will have exactly three 2's in it?

12. You roll a fair six-sided die 10 times. Each time a 5 is rolled you receive \$5. What's the probability that you receive at least \$40?