Foundations 12 – Introduction to Probability Part 1

Homework: Lesson #1 on Pg. 123: #1-11, Skip #5c

Ex 1

A six-sided die is rolled.

a) List all the possible outcomes (called the **Sample Space**)

b) List all the outcomes that result in a number bigger than 2 (called an **Event**)

{*The book calls events a* ***subset*** *of the sample space*}

c) Assuming it's a far die (all outcomes equally likely), what is the **probability** that you roll a number bigger than 2?

If all events are equally likely: P(some event) =

For any event: _____ $\leq$ *P(any event)* $\leq$ _____

Or _____ $\leq$ *P(any event)* $\leq$ _____

d) List the **event** "a number that is not bigger than 2" then find the probability of rolling a number that is not bigger than 2

The events in b) and d) are called __________________________ *events.*

We can write P(not bigger than 2) = _________________________.

P(bigger than 2) + P(not bigger than 2) = ___________ *or* _________

e) List the **event** "a number bigger than 8" then find the probability of rolling a number bigger than 8

If P(some event) = ______, we call the event ___________

f) List the **event** "a number less than 7" then find the probability of rolling a number less than 7

If P(some event) = ______, we call the event ___________

<u>Ex 2</u>

Jimmy flips two coins at the same time and wants to determine the probability of flipping both heads. He lists the **sample space** as {2 heads, 2 tails, 1 tail and 1 head}. Since only 1 of the three outcomes is favorable, he determines the probability to be $\frac{1}{3}$.

a) Explain why Jimmy's reasoning is not correct

b) Use a **tree diagram** to find the probability for each outcome (2 heads, 2 tails or 1 head 1 tail)

Ex 3

Instead of using tree diagrams, a table can be really helpful for listing out the **sample space** (all possible outcomes). An incomplete sample is shown on the side for two 6-sided dice.

a) Fill out the table to show the sample space

b) How many outcomes are in the sample space?

c) List the event:
"the same number appears on both dice"

d) Find the probability that the same number appears on both dice

e) Find the probability that different numbers appear on each die using the complement

Die #1

Die #2

	1	**2**	**3**	**4**	**5**	**6**
1	(1,1)	(1,2)	(1,3)	(1,4)	(1,5)	(1,6)
2						
3						
4						
5						
6						

With your partner, pick 2 <u>differently shaped</u> dice from the bag and do a) to e).

Foundations 12 – Introduction to Probability Part 2

Homework: Lesson #2 on Pg. 133: #1-15

Ex 1

Consider **Ex 3** from last time. Using the sample space in the table determine:

a) the probability that the sum of the dice is bigger than 8.

b) the probability that the sum of the dice is not bigger than 8. *(There are two ways to do this. Find both!)*

Another way we can express the chance of something happening is through **Odds**.

The **"Odds for"** or **"Odds in favor of"** the sum being bigger than 8 are: ____________ or ______________

The **"Odds against"** the sum being bigger than 8 are: ___________ or ________________

If you have **Even odds**, that means the odds for and against and equal: _______________ or _____________.

The means the probability would be ______ for either outcome.

Odds are different from probability and it can get a little tricky when you go between Odds and Probability.

$$\textit{Odds in favor of something} \Rightarrow$$

$$\textit{Odds against something} \Rightarrow$$

$$\textit{Probability of something} \Rightarrow$$

c) find the *odds for* and *odds against* the sum of the dice being bigger than 10 (in lowest terms)

Ex 2

The probability it will rain tomorrow is 0.65. What are the odds against it raining tomorrow?

Ex 3

The odds in favor of winning a stuffed animal at a raffle are 2:75 and the odds in favor of winning a jar of jellybeans is 2:105.

a) Which prize are you more likely to win? How do you know?

b) Find the probability of winning each prize.

Grab the same dice you used last class. Figure out the probability, odds for and odds against for the events:

a) the sum of the dice is bigger than 5

b) the sum of the dice is less than 5

c) explain why a) and b) are **not** complementary events

d) Roll the pair of dice 10 times, add up the numbers and record the results. Do the results exactly match the probabilities you calculated in a) and b)? Why or why not?