7.3

Wednesday, March 30, 2016   8:38 AM
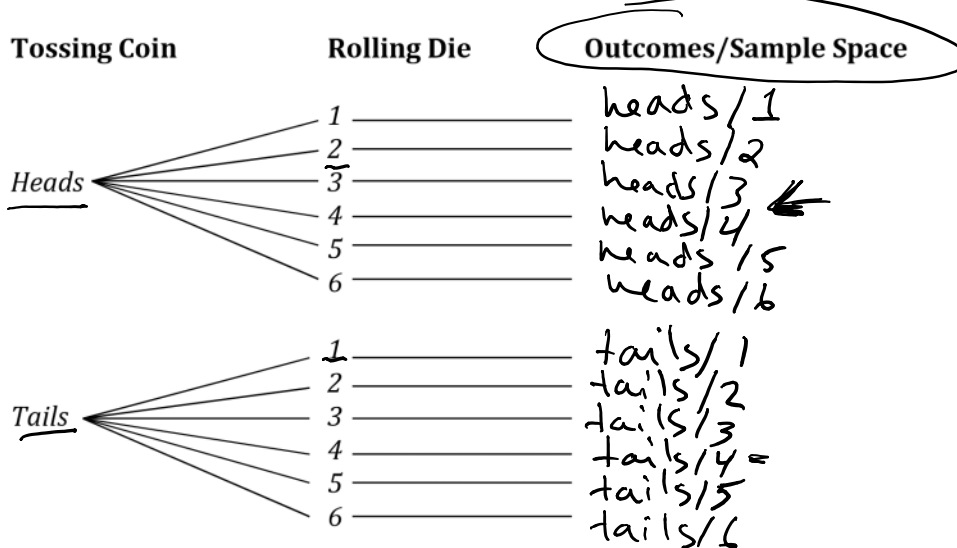
7.3 Probability of Independent Events

Two events are ___*independent*___ events when one event does ___*NOT*___ affect the other event.

A coin is tossed and a regular die labeled 1 to 6 is rolled.

This ___*tree*___ diagram shows the possible outcomes.

Tossing Coin	**Rolling Die**	**Outcomes/Sample Space**
Heads	1	heads/1
	2	heads/2
	3	heads/3
	4	heads/4
	5	heads/5
	6	heads/6
Tails	1	tails/1
	2	tails/2
	3	tails/3
	4	tails/4
	5	tails/5
	6	tails/6

Whether the coin lands on heads or tails has no effect on the outcome of rolling the die.
So, the two events are ___*independent*___.

There are ___12___ possible outcomes.

What is the probability of tossing heads? ___$\frac{6}{12} = \frac{1}{2}$___ (Reduce)

What is the probability of rolling a 4? ___$\frac{2}{12} = \frac{1}{6}$___

What is the probability of tossing heads **and** rolling a 4? ___$\frac{1}{12}$___   Note that $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$

The above illustrates the probability rule for two **independent** events:

P(A) and P(B) are the ___*individual*___ probabilities of the two events A and B.

P(A and B) is the probability of ___*both*___ A and B occurring.

If A and B are two independent events, P(A and B)=___$P(A) \times P(B)$___

Step 1: Find the probability of each independent event.
Step 2: Reduce each independent probability.
Step 3: Multiply the probabilities and reduce!

Try These:

1. A coin is tossed and a spinner is spun. The spinner has three equal sectors of red, green and blue. What is the probability of the coin landing on heads and the spinner landing on red or green?

The probability of heads P(H) = $\frac{1}{2}$

The probability of red or green P(R or G) = $\frac{2}{3}$

The probability of the coin landing on heads **and** the spinner landing on red or green is.

P(H/R or G)= P(H) x P(R or G) =

and 5

$$= \frac{1}{2} \times \frac{2}{3}$$

$$= \frac{2}{6}$$

$$= \frac{1}{3}$$

you
TRY

2. The pocket of a golf bag contains 9 white tees, 7 red tees and 4 blue tees.
The golfer removes one tee from her bag without looking, notes the color, then returns the tee to the pocket. The process is repeated.
Find the probability that the first tee is not red and the second tee is blue.

There are 20 tees in the pocket.

$9 + 4 = 13$

The probability of not red is P(not Red)= $\frac{13}{20}$

The probability of blue is P(Blue)= $\frac{4}{20} = \frac{1}{5}$

The probability of not red and blue is

$$P(\text{Not } R / B) = P(\text{Not } R) \times P(B)$$

$$= \frac{13}{20} \times \frac{1}{5}$$

$$= \frac{13}{100}$$

Assignment pg 411-413 #3-13 odd or even numbers

HW check next day