

11.1 Determining Probabilities Using Tree Diagrams

Probability is the likelihood or chance of an outcome occurring

Some definitions for you to know:

Sample Space: list of all possible outcomes

Independent Events: 2 events that do not affect each other,
ex roll a die, flip a coin

Outcomes: each possible/individual result

Can you express probability as a formula?

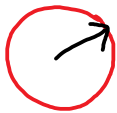
$$P(\text{event}) = \frac{\# \text{ of favorable outcomes}}{\text{total \# outcomes}}$$

Probability can be
a) fraction
b) decimal
c) percent

We can often determine probabilities from a tree diagram.

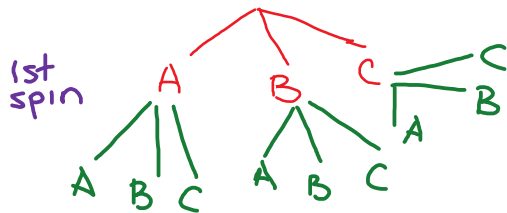
A spinner is divided into three equal regions called A, B, C. The spinner is spun twice.

a.) What is the probability of spinning an A on the first spin?



Fraction	Decimal	Percent
$\frac{1}{3}$	0.33	33.3%

b) We can represent the sample space by drawing a tree diagram.



We can use probability format to represent this question.

$$P(\text{A then B}) = \frac{1}{9}$$

c) What do you think the probability of spinning an A followed by a B?

$$\frac{1}{9}$$

d) What is the probability of getting the same letter on both spins
Represent in probability format

$$P(\text{same result}) = \frac{3}{9} = \frac{1}{3}$$

Determining Probabilities from a Table

Slick Rick McChip loves playing games with dice. He rolls two standard six-sided die. One die is black and one die is red. He always rolls two at a time. We can use a table to create a sample space for this situation.

		Black DIE					
		1	2	3	4	5	6
RED	1	1,1	1,2				
	2	2,1	2,2				
	3	3,1	3,2				
	4	4,1	4,2				
	5	5,1	5,2				
	6	6,1	6,2				

a) What is the probability of rolling doubles?

$$P(\text{doubles}) = \frac{6}{36} = \frac{1}{6}$$

b) What is the probability of rolling more than ten when we add the two outcomes

36 6

b) What is the probability of rolling more than ten when we add the two outcomes together?

$$P(\text{sum} > 10) = \frac{3}{36} = \frac{1}{12}$$

Represent this situation in probability format

c) What is the probability that the number on the red die is one larger than the number on the black die?

$$\frac{5}{36}$$

d) What is the probability that the sum of the two numbers is less than 11?

$$P(\text{sum} < 11) = \frac{33}{36} = \frac{11}{12}$$

Represent this situation in probability format

pg 416 # 3 - 8, 10, 11, 13 do on Mon