

$$P(\text{event}) = \frac{\# \text{ event favorable}}{\text{Total}}$$

Black
 Black
 Black
 Red
 Red
 Yellow

$$P(\text{Yellow}) = \frac{\# \text{ yellow}}{\text{Total}}$$

$$\text{Top} : \text{Bottom} = \frac{1}{6}$$

$$\begin{aligned} \times 100 \quad \text{Decimal} &= 0.16 \\ \quad \quad \quad \quad \quad \quad \% &= 16\% \end{aligned}$$



Section 7.6 Tree Diagrams



Recall that an OUTCOME is the result of an experiment or action.

Some experiments have two or more actions

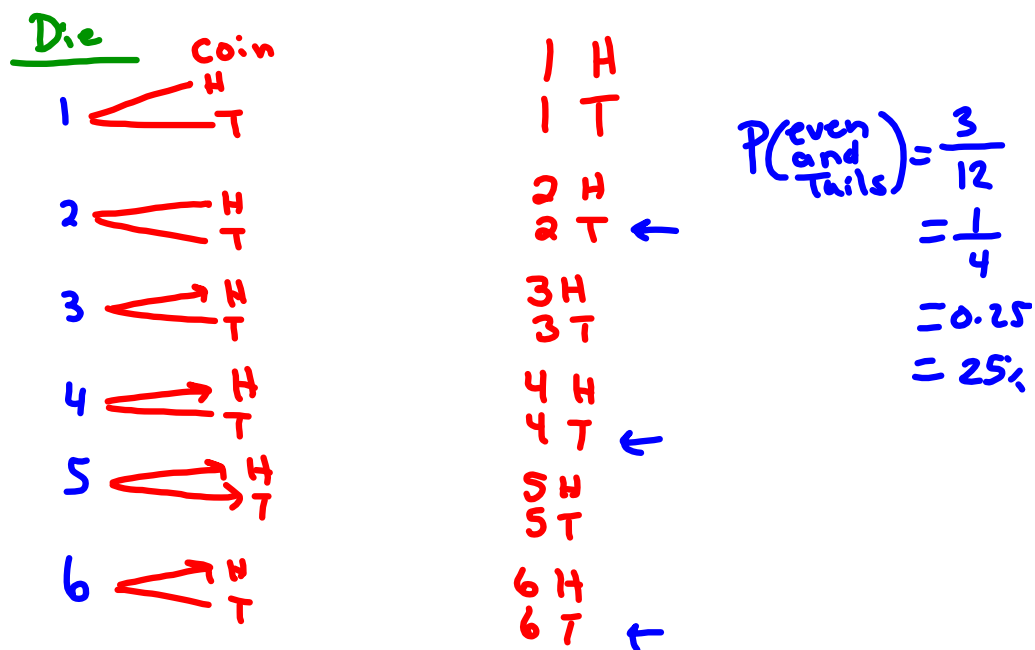
Like Rolling a die and tossing a coin

Like Tossing two coins

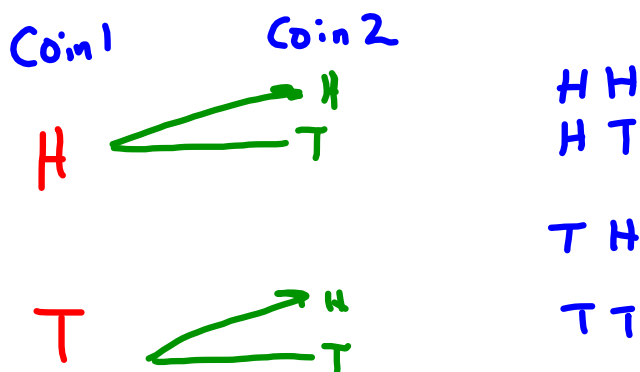
Definition of Tree Diagram

- > A tree diagram shows all the possible outcomes of an event.
- > All possible outcomes of an event are shown by a tree diagram.

Let's do a tree diagram for the following H or T (Always list the possible outcomes)
Rolling a die labeled 1 to 6 and tossing coin



b) Tossing two coins



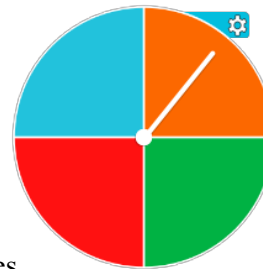
Tree Diagrams

You can find the possible outcomes for any given events using either a chart or a tree diagram.

Two events are **independent** if the results of one event does not depend on the result of the other event.

Ex) Spinning a spinner is an independent event, the result from the first spin has no effect on the second spin.

We can use a tree diagram to list all possible outcomes with independent events.

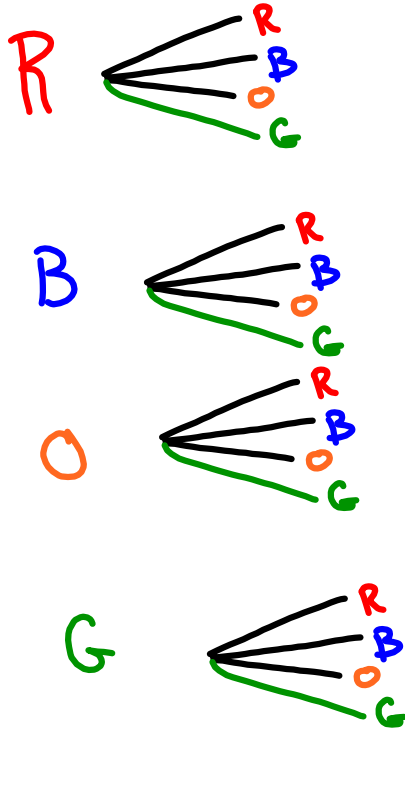


Let's Make A Tree Diagram

First spin

Second Spin

Possible Outcomes



- RR
- RB
- RO
- RG

- BR
- BB
- BO
- BG

- OR
- OB
- OO
- OG

- GR
- GB
- GO
- GG

- Red
- Blue
- Orange
- Green

Total Outcomes = 16

1 $P(\text{two red}) = \frac{1}{16} = 0.0625 = 6.25\%$

$P(\text{Red and Green}) = \frac{2}{16} = \frac{1}{8} = 0.125 = 12.5\%$
Order doesn't matter here

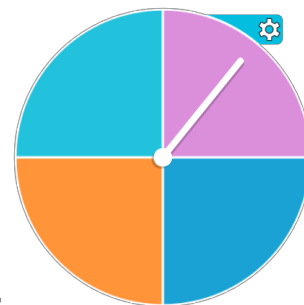
Using Charts and Tree Diagrams

You can find the possible outcomes for any given events using either a chart or a tree diagram.

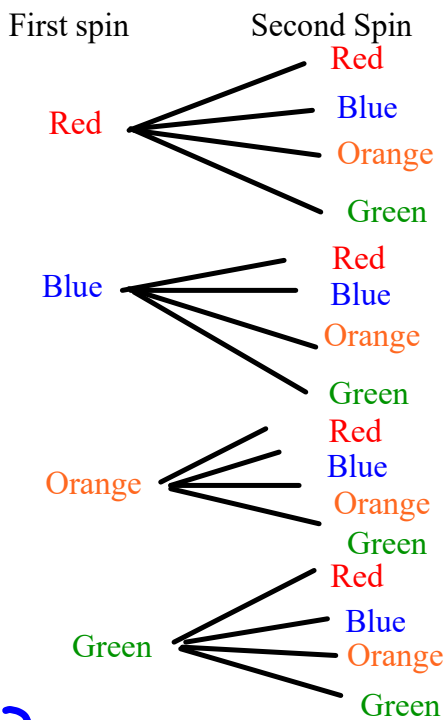
Two events are **independent** if the results of one event does not depend on the result of the other event.

Ex) Spinning a spinner is an independent event, the result from the first spin has no effect on the second spin.

We can use a tree diagram to list all possible outcomes with independent events.



Tree Diagram



Possible Outcomes

- Red Red
- Red Blue
- Red Orange
- Red Green
- Blue Red
- Blue Blue
- Blue Orange
- Blue Green
- Orange Red
- Orange Blue
- Orange Orange
- Orange Green
- Green Red
- Green Blue
- Green Orange
- Green Green

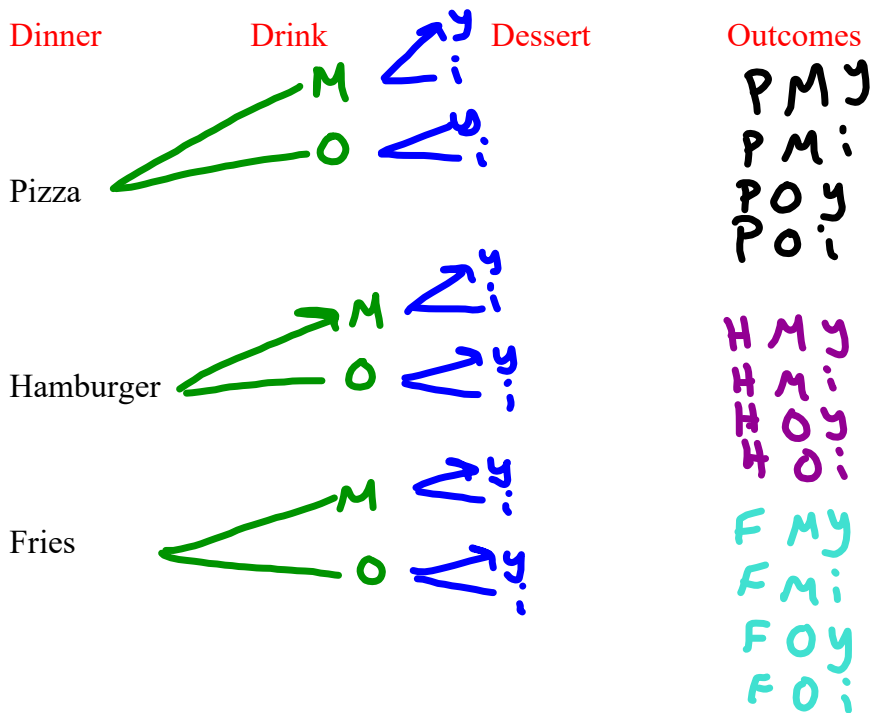
$Prob(2 R) = \frac{1}{16}$
 $Prob(R \text{ and } G) = \frac{2}{16}$

$P(\text{two red}) =$

Make a tree diagram $(3) \times (2) \times 2 = 12$ total

For dinner you have 3 choices; pizza, hamburger or fries, there are 2 choices for the drink; milk or orange juice and there are 2 choices for dessert; yougurt or ice cream.

Tree Diagram



You can also use a table or chart to find all possible outcomes.

Table or Chart

Possible Outcomes	Dinner			Drink		Dessert	
	Pizza	Hamb	Fries	Milk	OJ	Yougurt	Ice Cream
1	✓			✓		✓	
2	✓			✓			✓
3	✓				✓	✓	
4	✓				✓		✓
5		✓		✓		✓	
6		✓		✓			✓
7		✓			✓	✓	
8		✓			✓		✓
9			✓	✓		✓	
10			✓	✓			✓
11			✓		✓	✓	
12			✓		✓		✓

Class/Homework

LIST THE OUTCOMES

pg. 287 # 1abc, #2, #3, #4, #5,

Trees → if time
 answer based on tree

Test in 2 days time

3 $\begin{matrix} \text{H} \\ \swarrow \downarrow \end{matrix}$

4 $\begin{matrix} \text{H} \\ \swarrow \downarrow \end{matrix}$

5 $\begin{matrix} \text{H} \\ \swarrow \downarrow \end{matrix}$

6 $\begin{matrix} \text{H} \\ \swarrow \downarrow \end{matrix}$

7 $\begin{matrix} \text{H} \\ \swarrow \downarrow \end{matrix}$

8 $\begin{matrix} \text{H} \\ \swarrow \downarrow \end{matrix}$

3H ✓

3T ✓

4H ✓

4T ✓

5H

5T

6H

6T

7H

7T

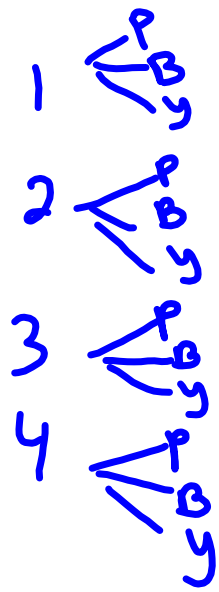
8H

8T

2) $P(\text{odd or Head}) = \frac{9}{12}$
 Aseea
 $= \frac{3}{4}$
 $= 0.75$
 $= 75\%$
 Aseea

$P(\text{\# less than 5}) = \frac{4}{12} = \frac{1}{3}$
 Reberto
 $= 0.\bar{3}$
 $= 33\%$

Aseea more likly



- 1B
- 1P
- 2B
- 2P
- 3B
- 3P
- 4B
- 4P

3) $P(\text{# less than 3}) = \frac{1}{2}$
 $= \frac{6}{12}$

less than 3

3P $P(\text{Even #})$

3B $P(\text{odd #})$

- 4P
- 4B
- 4P
- 4B

12 outcomes

half = 6