I. Tree diagram
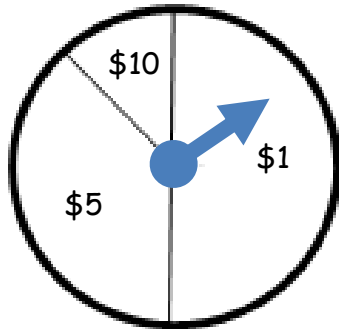
What if we are trying to determine the probability of two independent events both occurring. We can use a tree diagram to show the different combinations of events and the probability of every possible result.
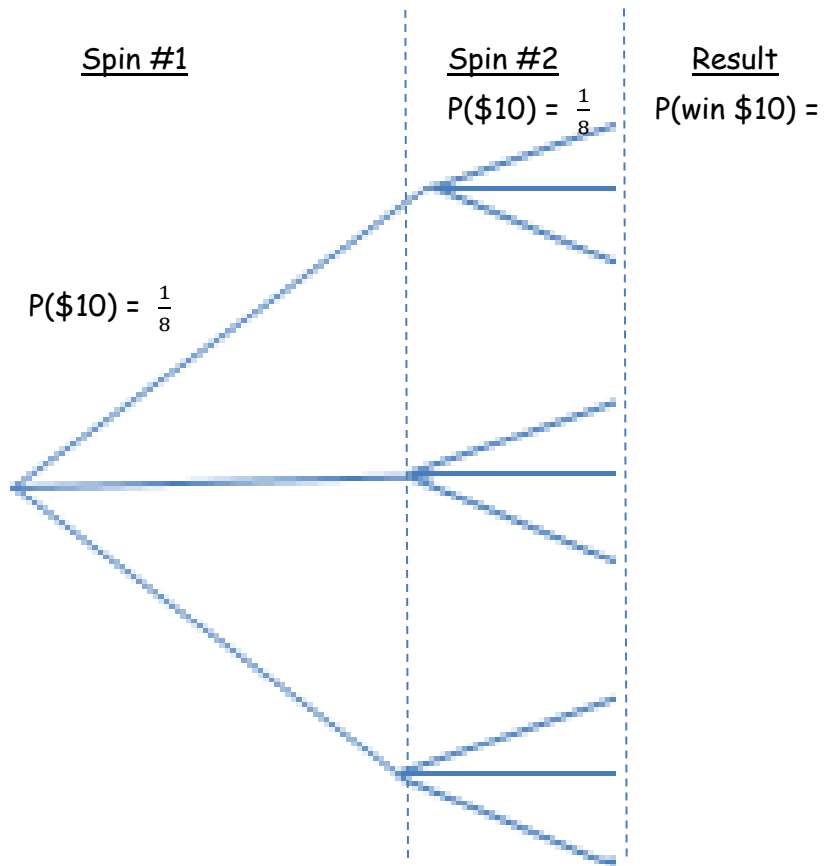
Example: "Double Spin"

| A player spins twice. If they get the same amount both spins, they win that amount of money. |

$10

$1

$5

The $10 is $\frac{1}{8}$ of the circle,

$5 is $\frac{3}{8}$ of the circle , and

$1 is $\frac{1}{2}$ of the circle

Spin #1   Spin #2   Result
                          P($10) = $\frac{1}{8}$ P(win $10) =

Label each branch with a possible outcome and the probability it will occur.

Follow the branches and multiply the probabilities to find the probabilities of each possible outcome after two spins.
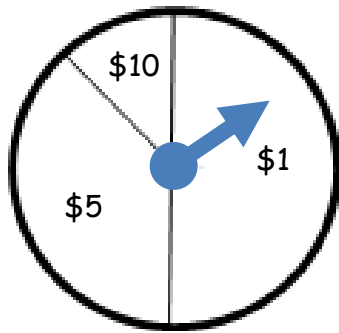
P($10) = $\frac{1}{8}$

Find the following probabilities:

P(win $1)=   P(win $5)=   P(win $10)=   P(win any amount)=

II. Area Models

We can also use an area model to organize all of the different possible outcomes.

Example: "Double Spin"

$10

$1

$5

A player spins twice. If they get the same amount both spins, they win that amount of money.

The $10 is $\frac{1}{8}$ of the circle,

$5 is $\frac{3}{8}$ of the circle, and

$1 is ½ of the circle

We can find the probabilities of every possible outcome by creating an area model.

On the outside of the rectangle, list the possible outcomes and their probability.

Inside the rectangle, multiply those probabilities together to find the probability that both events occur.

Spin #2

$10

$\frac{1}{8}$

win $10   win $0

Spin #1

Find the following probabilities:

P(win $1)=   P(win $5)=   P(win $10)=   P(win any amount)=

Which model do you prefer? Explain.

Which model would you use if there were more than two independent events (such as a third spin)? Explain.