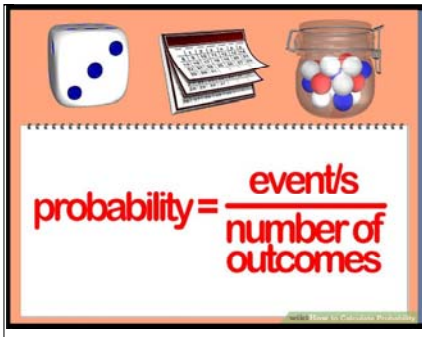
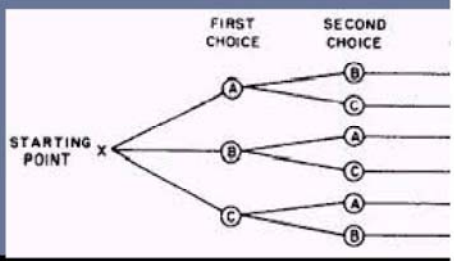




5.11 Independent Events

Ex.) Anne and Bobbi each have 19 marbles: 11 red and 8 blue. Anne places 7 red marbles and 3 blue marbles in bag 1. She places the rest of her marbles in bag 2. Bobbi places all her marbles in bag 3. Anne then draws one marble from bag 1 and one marble from bag 2. Bobbi draws two marbles from bag 3, without replacement. Are both girls equally likely to draw two red marbles?

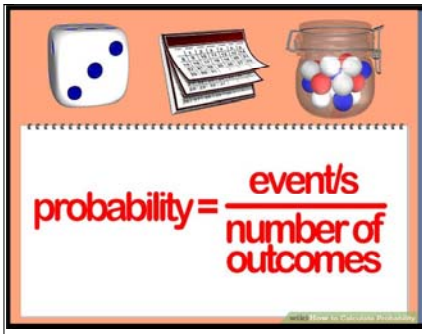
Bag 1: 7r 3b Bag 2: 4r 5b Bag 3: 11r 8b

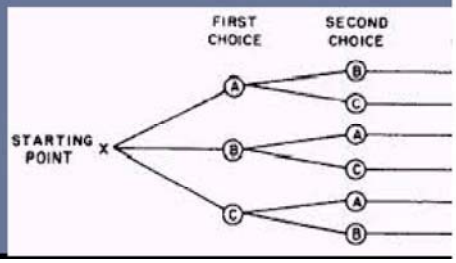
1. If Anne takes two marbles out of two different bags, is her event dependent or independent?

independent

2. If Bobbi takes two marbles out of the same bag without replacement, is her event dependent or independent?

dependent





3. Determine the probability of Anne drawing two red marbles.

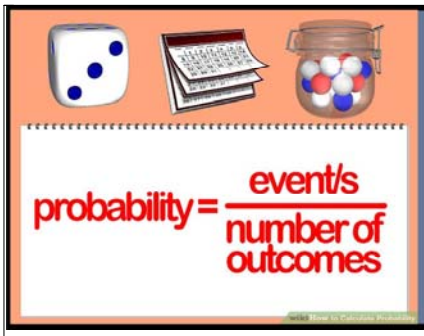
$\frac{7}{10} \times \frac{4}{9} = \frac{14}{45} = 31\%$

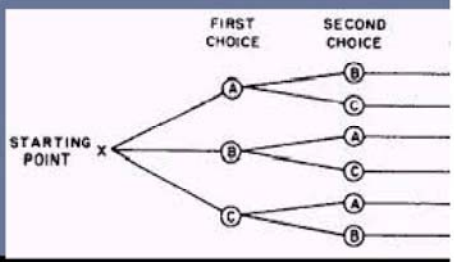
4. Determine the probability of Bobbie drawing two red marbles.

$\frac{11}{19} \times \frac{10}{18} = \frac{55}{171} = 32\%$

5. Are both girls equally likely to draw two red marbles? Explain.

No, Bobbie is more likely than Anne.
1%





Ex.) Moe and Shantelle are playing a die and coin game. Each turn consists of rolling a regular die and tossing a coin. Points are awarded for rolling a 6 on a die and/or tossing heads with the coin:

- 1 point for either outcome
- 3 points for both outcomes
- 0 points for neither outcome

Players alternate turn. The first player who gets 10 points wins. Determine the probability that Moe will get 1, 3, or 0 points on his first turn.

Coin Die

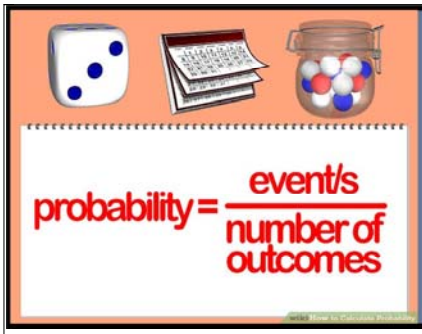
H $\frac{1}{2}$ — $\frac{1}{6}$, $\frac{5}{6}$

T $\frac{1}{2}$ — $\frac{1}{6}$, $\frac{5}{6}$

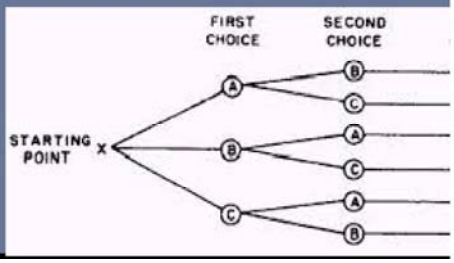
1 pt: H and $\frac{1}{2}$ + not 6 and $\frac{1}{6}$ = $\frac{2}{3}$ = 67%

3 pts: $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$ = 8%

0 pts: T and $\frac{1}{2}$ × not 6 and $\frac{5}{6}$ = $\frac{5}{12}$ = 42%



probability = event/s / number of outcomes



Ex.) For each situation:

1: classify the events as either independent or dependent

2: determine the probability of the event happening

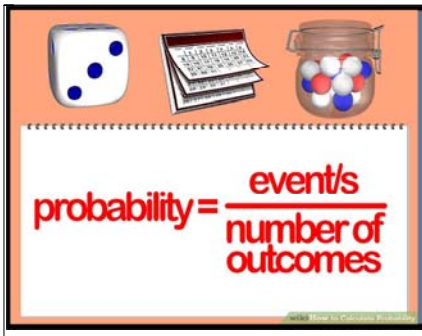
a. A four-colour spinner is spun, and a die is rolled. The first event is spinning a red, and the second event is rolling a 2.

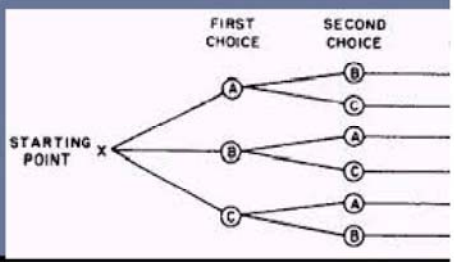
independent : spin red & roll 2 $\frac{1}{4} \times \frac{1}{6} = \boxed{\frac{1}{24}}$ 1:23

b. A red die and green die are rolled. The first event is rolling a 1 on the red die, and second event is rolling a 5 on the green die.

$\frac{1}{6} \times \frac{1}{6}$

$= \boxed{\frac{1}{36}}$





c. Two cards are drawn, without being replaced, from a standard deck of 52 playing cards. The first event is drawing a king, and the second event is drawing an ace.

dependent: $\frac{4}{52} \times \frac{4}{51} = \frac{16}{2652} = \boxed{\frac{4}{663}}$

d. There are 30 cards, numbered 1 to 30, in a box. Two cards are drawn, one at a time, with replacement. The first event is drawing a prime number, and the second event is drawing a number that is multiple of 5.

prime: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29.

mult. 5: 5, 10, 15, 20, 25, 30.

prime & mult 5

$\frac{10}{30} \times \frac{6}{30}$

$= \frac{60}{900} = \boxed{\frac{3}{45}} = 6.6\%$

Pg. 198 # 2, 3, 6, 7-9.