What's Going On?

Checking In

Minds on Rolling the Dice... Twice!

Action! Compound and Conditional Probability

Consolidation Practice!

Learning Goal - I will be able to calculate compound probability and conditional probability.

Minds on

Simple Probability

What is the probability that we will draw a red card?

$\frac{26}{52} = \frac{1}{2} = 0.5 = 50\%$

What is the probability that we will draw a club?

$\frac{13}{52} = \frac{1}{4} = 0.25 = 25\%$

What is the probability that we will draw a face card? (Jack, Queen, or King)

$\frac{12}{52} = \frac{3}{13} = 0.231 = 23.1\%$

What is the probability of drawing a red Ace?

$\frac{2}{52} = \frac{1}{26} = 0.036 = 3.8\%$

Minds on

Rolling the Dice... Twice!

For this experiment, you will be rolling a pair of dice 30 times. This time, all I want you to record is the sum of the two dice. (the numbers on the dice ADDED together)

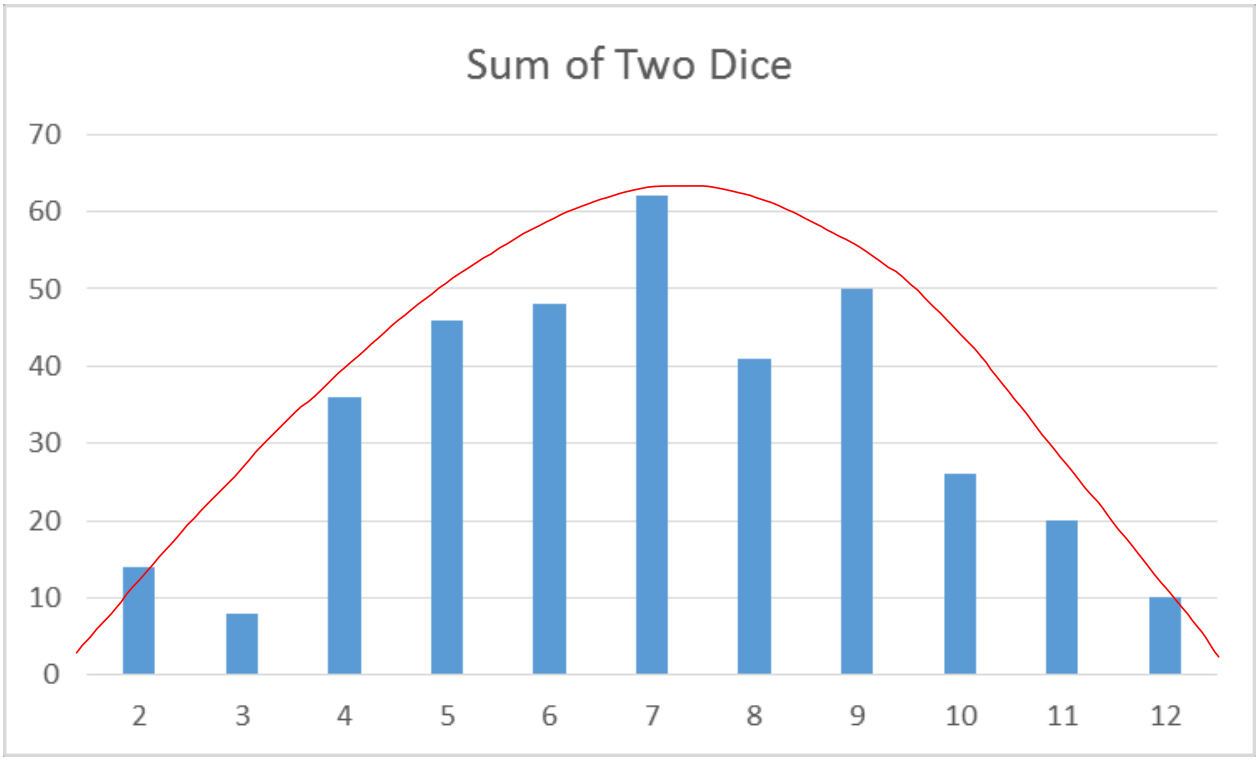
Sum	Tally	Frequency	Experimental Probability
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Minds on

Rolling the Dice... Twice!

Class Results 361

Sum	Frequency	Experimental Probability
2	14	3.9%
3	8	2.2%
4	36	10.0%
5	46	12.7%
6	48	13.3%
7	62	17.2%
8	41	11.4%
9	50	13.9%
10	26	7.2%
11	20	5.5%
12	10	2.8%


Sum of Two Dice
70
60
50
40
30
20
10
0
2
3
4
5
6
7
8
9
10
11
12

Action!

Compound Probability

Compound probability deals with multiple independent events.

Examples: Flipping three coins (from last time)
Rolling two dice (today)

Flipping Three Coins and Rolling Two Dice are examples of **COMPOUND PROBABILITY**.

Compound: the probability of one

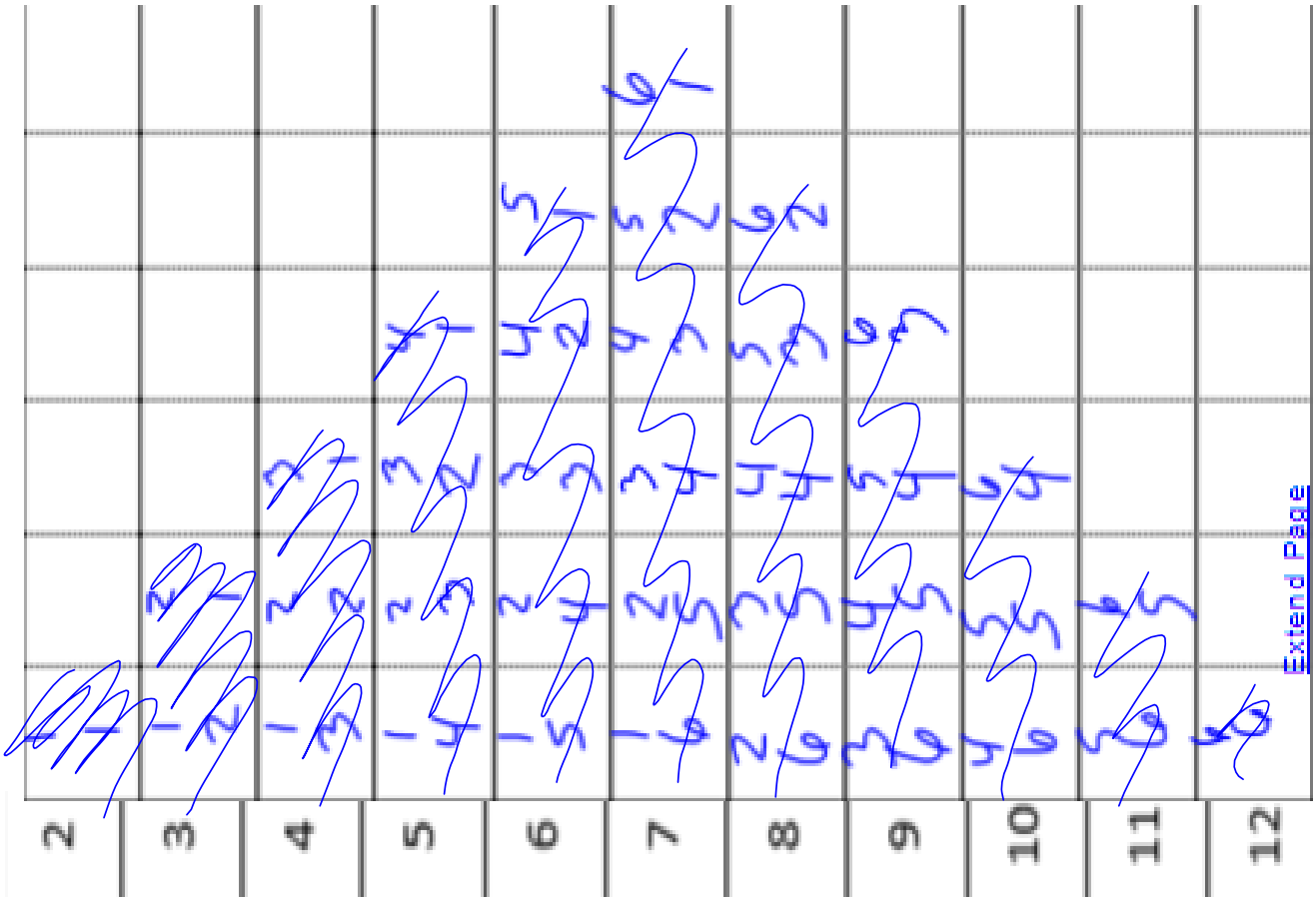
event does not depend on the

other event(s).

Action!

Rolling the dice.. Twice!

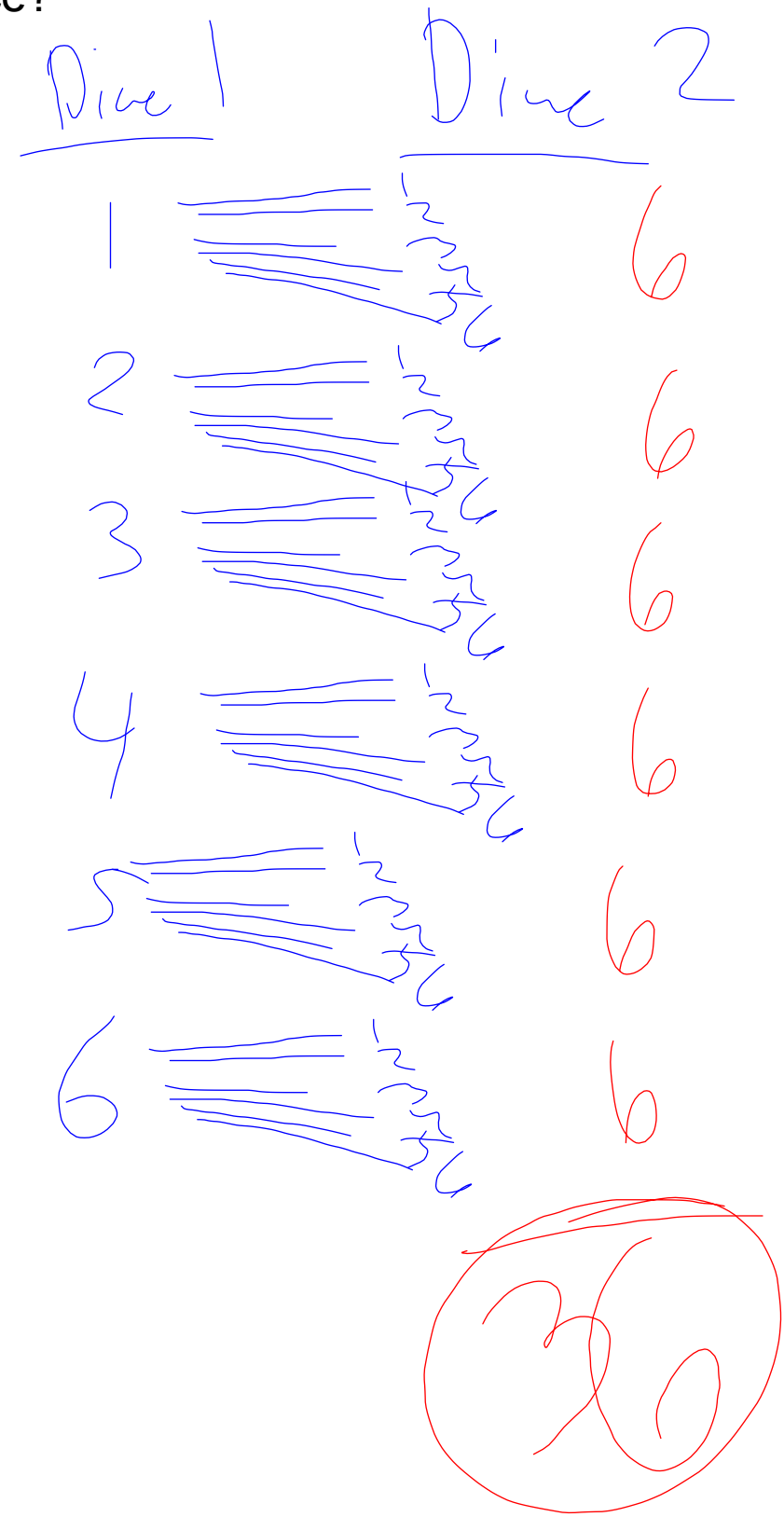
Sum	How many ways can it happen?	What are the ways it can happen?					
2	1	1 1					
3	2	1 2	2 1				
4	3	1 3	2 2	3 1			
5	4	1 4	2 3	3 2	4 1		
6	5	1 5	2 4	3 3	4 2	5 1	
7	6	1 6	2 5	3 4	4 3	5 2	6 1
8	5	2 6	3 5	4 4	5 3	6 2	
9	4	3 6	4 5	5 4	6 3		
10	3	4 6	5 5	6 4			
11	2	5 6	6 5				
12	1	6 6					


2
3
4
5
6
7
8
9
10
11
12
Extend Page

Action!

Rolling the dice.. Twice!

How many total ways are there of rolling two dice?



Action!

Rolling the dice.. Twice!

Sum	How many ways can it happen?	What is the Probability it Will Happen?
2	1	2.8%
3	2	5.6%
4	3	8.3%
5	4	11.1%
6	5	13.9%
7	6	16.7%
8	5	13.9%
9	4	11.1%
10	3	8.3%
11	2	5.6%
12	1	2.8%

36 100.1%

Action!

Conditional Probability

Conditional probability deals with multiple **dependent** events.

Examples: Drawing multiple cards (today)

Drawing multiple cards is an example of **CONDITIONAL PROBABILITY**.

Conditional Probability: the probability of one event depends on the other event(s).

Action!

Hold 'em

In Texas Hold 'em Poker, players are dealt two "Hole" cards.

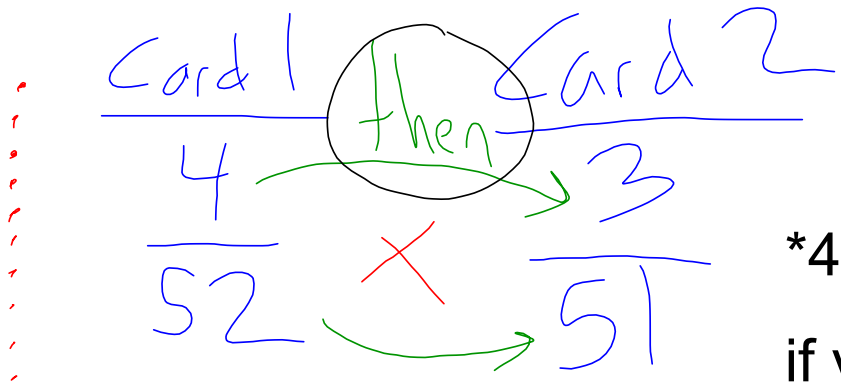
Let's say I have been dealt a King.

What is the probability that my second card will be a king?

Action!

Hold 'em

The best possible hand to be dealt is two Aces.
What is the probability of being dealt two Aces?



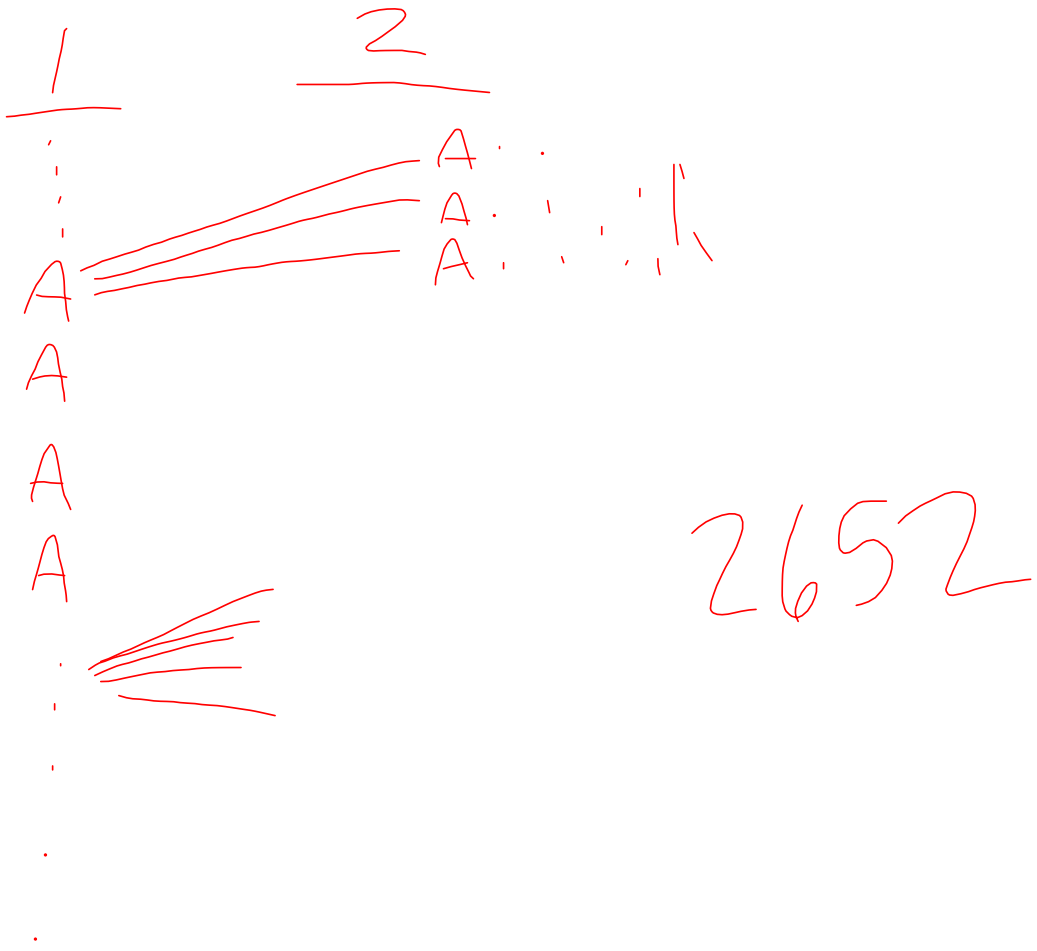
*4 aces in a deck

if you draw a card, there are 3 left and only 51 cards

$= \frac{12}{2652}$

$= 0.0045$

$= 0.5\%$


1
2
A
A
A
A
A
A
A
A
A
2652

Action!

Hold 'em

What is the probability of being dealt two spades?

$$\frac{1}{13} \times \frac{12}{51} = \frac{156}{2652} = 5.9\%$$

The worst possible hand to be dealt is a 2 and a 7.
What is the probability of being dealt a 2 and a 7?

$$\frac{8}{52} \times \frac{4}{51} = \frac{32}{2652}$$

2 or 7 : if 2 then 7
: if 7 then 2

What is the probability of being dealt **any** pair?

$$\frac{1}{\frac{52}{52}} \times \frac{2}{51} = 0.059 = 5.9\%$$

First can be anything. Then 3 of the cards left will make a pair.