## WHAT DO YOU RNOW ABOUT A DECK OF CARDS??

-Total Number:

-Number and type of Suits: 4 (lubs, spades diamonds,hearts
-Number of cards in each suit: 13
-Types of Face Cards Jack King Queen
-Number of each Face Card: 4
-Number of Black Cards: 26
-Number of Red Cards: 26

## PROBABILITY

Part 2

$$
\frac{\text { \#of outcomes you desire }}{\text { total \#of outcomes }}
$$

## ODDS

 $4: 28$

- When all outcomes are equally likely, the odds in favor of an event $A$ is defined as:
$A: A^{c}$

Number of Outcomes in A
Number of Outcomes not in A

Example: A card is drawn from a standard deck of 52 cards.

1. Find the odds of drawing a $10.4: 4 / 8-1: 12$
2. Find the odds of drawing a Heart.

## YOU TRY..

- 1500 students ordered lunch at the cafeteria on Monday. 625 students had a sub sandwich, 825 students had pizza, andl00 students had both a sub and a piece of pizza. What are the odds that a chosen student did not have either a sub or a pizza?


$$
\begin{array}{r}
1500 \\
-1350
\end{array}
$$

150

MAGIC WORDS:

$$
\begin{aligned}
& \text { * Intersection* And: } \\
& \text { (with two events) } \\
& 2 \text { requirements } \\
& \text { must satisfy BOTH }
\end{aligned}
$$


"*Union* Or:
U
2 requirements,
must satisfy 1


## PROBABILITY OF COMPOUND EVENTS

If $A$ and $B$ are any 2 events, then the probability of $A$ or $B$ is


If $A$ and $B$ are disjoint events, then the probability of $A$ or $B$ is

(Mutually Exclusive)

EX.

- A card is randomly selected from a standard deck of 52 cards. What is the probability that it is a 10 or a face card?

$$
4+12=\frac{16}{52}=4 / 13
$$

- A six sided die is rolled. What is the probability that the number rolled is less than 3 or greater than 5 ?

2) $45 \square$

$$
\frac{3}{6}=(1 / 2) \frac{2+1}{6}
$$

MORE EX.

- A card is randomly selected from a standard deck of 52 cards. What is the probability that it is a face card or a spade?

$$
\begin{aligned}
& 12 \text { face }+13 \text { spade }-3 b_{o t h} \\
& 12 \text { fact }+10 \text { spade } \\
& (10+\text { tact })
\end{aligned}=22=\frac{22}{52}=11
$$

- A six sided die is rolled. What is the probability of rolling a number greater than 4 or even?

$$
103 \cup 8=\frac{4}{6}=\frac{2}{3}
$$

## U DO!!!

A card is randomly selected from a standard deck of 52 cards. Find the probability of drawing the given card.
a) A king and a diamond $1 / 52$
b) A king or a diamond $4+12=16 / 52$ 4/13 $4+13-1$
c) A spade or a club $13+13=26$
d) A 4 or a $54+48 / 52$
e) Not a heart


- A fair coin is tossed and a spinner is spun that has three equal regions numbered 1,2 ,an d3.



## REPLACEMENT VS. NON-REPLACEMENT:

You randomly select 2 cards from a standard deck of 52 cards. What is the probability that the first card is not a heart and the second is a heart...
a) If you replace the first card before selecting the second.

$$
\frac{39}{52} \cdot \frac{13}{52}
$$

$$
\frac{3}{16} 0,18.7 \%
$$

b) If you do not replace the first card.


## YOU TRY!

Find the probability of drawing the given cards from a standard deck of cards (a) with replacement and then (b) without replacement.

1. A club, then a diamond

$$
\frac{13}{52} \frac{13}{52}=
$$

$$
\frac{13}{52} \cdot \frac{13}{51}
$$

2. A jack, then a 7

3. A 5 , then $\frac{52}{\text { a face card, then an ace }}$

$$
\frac{4}{52} \cdot \frac{4}{51}
$$

$$
\frac{4}{52} \cdot \frac{12}{52} \cdot \frac{4}{52} \quad \frac{4}{52} \cdot \frac{12}{51} \cdot \frac{4}{50}
$$

4. A king, then another king, then a third king

$$
\frac{4}{52} \cdot \frac{4}{52} \cdot \frac{4}{52} \quad \frac{4}{52} \cdot \frac{3}{51} \cdot \frac{2}{50}
$$

## YOU TRY! <br> Finish (or rework) HW 9-1. <br> Tonight's HW is 9-2.

