number, face cards (J, Q, K) are worth 10 and Aces are worth 1 or 11 (whichever is better for you). So	
getting an Ace and a ten gets you 21 ("Blackjack")!	
a) P(First card is an Ace) _ 4 fav	1.7%
b) P(First card is a face card) = 12 = 2	30 1% AND 1 (and is ou
c) P(First card is a face card and second card is	$36 \frac{1\%}{52} = \frac{12}{52} = \frac{1.8\%}{5}$
d) Why can't you determine P(Second card is an ace) on its own?	
first card is! 1st card Ace =) 3/51 1st card Not Ace =) 4/51	
515	
If the probability of Event B depends on whether or not Event A has occurred, Events A and B	
are called dependent events.	
If the probability of Event B DOES NOT depend on whether or not Event A has occurred, Events	
A and B are called independent events.	
Independent Events	Dependent Events
· two like rolls	off and 2nd Lawn from a Lech
· two coin flips	from a dech
Law hour Cords	· Breaking a bone if you

How could we change the rules of Blackjack so that every card drawn is an independent event?

Play with replacement

Let's go back to Blackjack again. Let A = {first_card is a face card B = {second card is an ace} When we calculated the probability for part c) of the warm-up, we used the fact that: Given

 $P(A \cap B) = P(A) \times P(B \text{ given that/} A \text{ happened})$

P(B given that A happened) = We use the notation:

So the formula is:

NOTE: $(P(A \cap B) = P(B \cap A)$ even though the calculations are different

Ex 1

Two cards are drawn from a deck while playing Blackjack (without replacement). Use the formula to determine the probability of the following events:

a) Both cards are face cards at face
A-1st face B-2nd face

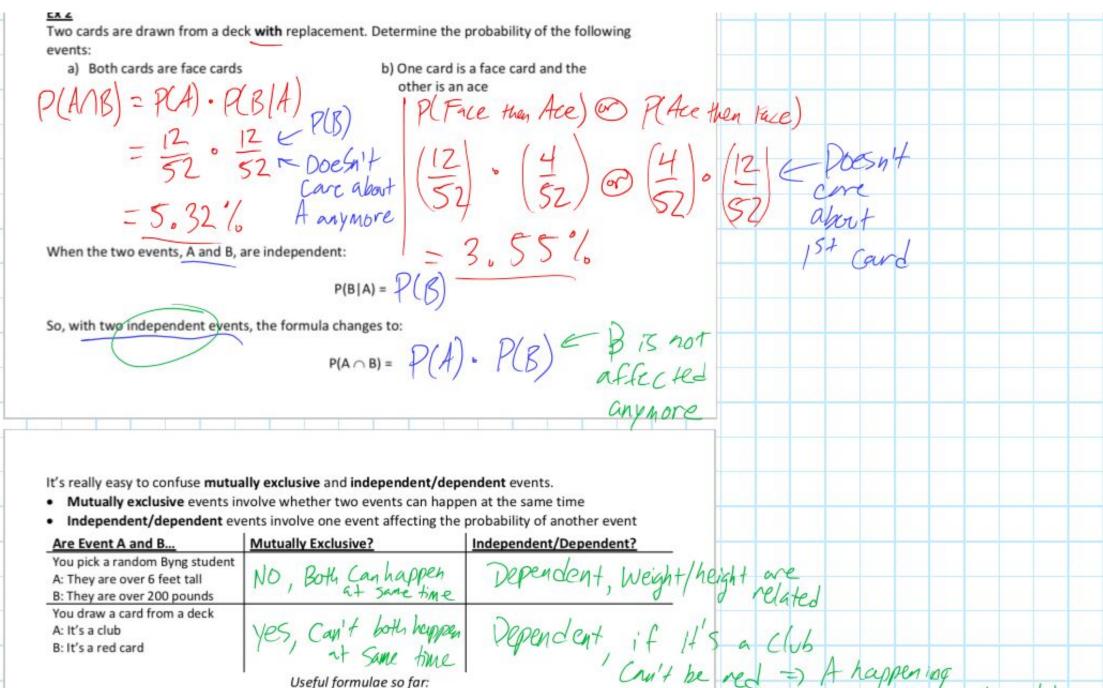
$$=\left(\frac{12}{52}\right)\cdot\left(\frac{11}{51}\right)$$

b) One card is a face card and the other is an ace (different from the warmup!)

P(Face then Ace) @ P(Ace then Face)

Ex 2

Two cards are drawn from a deck with replacement. Determine the probability of the following events:



Ex 3

If P(A) = $\frac{1}{4}$, P(B) = $\frac{2}{5}$ and P(A \cup B) = $\frac{3}{5}$, use appropriate formulas to determine:

 $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

a) P(A ∩ B)

b) P(B|A)

c) P(A|B)

 $P(A \cap B) = P(A) \cdot P(B|A)$

affects the probability