Name: ______ Probability of More than One Event

EXAMPLE

If you choose a card out of a 52-card deck, which has 36 number cards and 4 aces, and then roll a standard die (numbers 1-6), what is the probability that you will get an number card from the deck and a 4 or a 5 from the die?

1st event: Number Card

There are 36 number cards in the deck (total: 52), so the probability of a number card is: $\frac{36}{52} = \frac{36 \div 4}{52 \div 4} = \frac{9}{13}$

2nd event: 4 or 5

There are one of each number on the die (total: 6), and either a 4 or a 5 would work, the probability of a 4 or a 5 is: $\frac{2}{6} = \frac{2 \div 2}{6 \div 2} = \frac{1}{3}$

Fractions

Combined

Probability

1 st 2^{nd} 1st 2^{nd} × × To combine the two Event To combine the two Event Event Event events, you must Red 1: Red 2: events, you must Ace: 4 or 5: Original Original 36 2 9 8 multiply the two х multiply the two × Fractions Fractions 15 52 14 probabilities: probabilities: 6 $\frac{\frac{9}{13} \times \frac{1}{3}}{\frac{9+3}{39+3}} = \frac{\frac{9}{39}}{\frac{3}{13}}$ $\frac{\frac{3}{5}\times\frac{4}{7}}{\frac{5}{5}\times\frac{4}{7}} = \frac{12}{35}$ Reduced 9 1 Reduced 3 4 × × 5 7 3 13 Fractions Fractions 3 12 Combined Combined = 23.1% = 34.3%35 Probability 13 Probability

 1. If you roll a standard die (numbers 1-6) twice what is the probability that you will get a 5 and an even number?
 2. If you grab a shirt at random out of a closet, which has 3 T-shirts and 4 button-ups, and then randomly choose a pair of socks out of a drawer, which has 4 pairs of white socks and 2 pairs of black socks, what is the probability of choosing a T-shirt and a pair of white socks?

 1st
 X
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 1st
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		Event	×	Event			Event	×	Event
	Original		X			Original		×	
	Fractions					Fractions			
	Reduced		\sim			Reduced		\sim	
	Fractions		^			Fractions		^	
	Combined					Combined			
	Probability					Probability			
3. There are 10 freshmen, 12 juniors and 13 seniors in a				4. The names of 10 freshmen, 12 juniors and 13 seniors are					
classroom. If 2 students are chosen at random to carry boxes				in a jar. If 2 student names are chosen at random to win a					
to another room, what is the probability that they will both					prize, what is the probability that both prizes will be won by				
be freshmen?				freshmen, given that the names are put back in the jar after					
					each prize is awarded?	-			
		1 st		2 nd	-		1 st		2 nd
		Event	×	Event			Event	×	Event
	Original		×			Original		~	
	Fractions					Fractions		×	
	Reduced					Reduced			

EXAMPLE

There are 9 red shirts, 3 black shirts and 3 blue shirts in a bag. If 2 shirts are chosen at random, what is the probability of choosing 2 red shirts?

1st event: Red Shirt 1

There are 9 red shirts out of a total of 15 shirts, so the probability is: $\frac{9}{15} = \frac{9+3}{15+3} = \frac{3}{5}$

2nd event: Red Shirt 2

The first shirt was **not** put back, so there is 1 fewer red shirt, which means there are now 8 red shirts out of a total of 14, so the probability is: $\frac{8}{14} = \frac{8+2}{14+2} = \frac{4}{7}$

Fractions

Combined

Probability

				Name:			Per:	
5. If you choose a flavor of	of ice cream ou	sible	6. If you choose 2 scoops of ice cream at random from 32					
flavors, and then choose either a cup or a cone at random,				possible flavors, given that you must choose two different				
what is the probability that you will get a scoop of mint				flavors, what is the probability of choosing Strawberry and				
chocolate chip in a cone?			Bubblegum?					
_		1 st	2 nd	_		1 st	2 nd	
		Event	Event			Event	Event	
	Original				Original			
	Fractions				Fractions			
	Reduced				Reduced			
	Fractions				Fractions			
	Combined				Combined			
	Probability				Probability			
7. If you choose a card at	random from a	152-card d	eck, put it	8. If you choose a card at r	andom from a	a 52-card d	eck and	
back, and then choose an	other card, wh	at is the pr	obability	then choose another card, what is the probability that you				
that you will choose a 9 a	nd then choose	e the exact	same	will choose a 9 and then choose the exact same card?				
card?								
		1 st	2 nd			1 st	2 nd	
		Event	Event			Event	Event	
	Original				Original			
	Fractions				Fractions			
	Reduced				Reduced			
	Fractions				Fractions			
	Combined				Combined			
	Probability				Probability			
		11 2 1	1			11 0	1	
9. There are 5 green mar	bles, 8 black m	arbles, 3 c	lear	10. There are 5 green man	rbles, 8 black	marbles, 3	clear	
9. There are 5 green mar marbles and 4 striped ma	bles, 8 black m Irbles in a bag.	arbles, 3 cl If a marble	lear e is	10. There are 5 green man marbles and 4 striped man	rbles, 8 black i rbles in a bag.	marbles, 3 If 2 marble	clear es are	
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	Probability of More than One Event Answers	
1. Combined Probability: $\frac{1}{12} = 8.3\%$	2. Combined Probability: $\frac{2}{7} = 28.6\%$	3. Combined Probability: $\frac{9}{119} = 7.6\%$
4. Combined Probability: $\frac{4}{49} = 8.2\%$	5. Combined Probability: $\frac{1}{64} = 1.6\%$	6. Combined Probability: $\frac{1}{992} = 0.1\%$
7. Combined Probability: $\frac{1}{676} = 0.1\%$	8. Combined Probability: $\frac{0}{1} = 0.0\%$	9. Combined Probability: $\frac{1}{10} = 10.0\%$
10. Combined Probability: $\frac{2}{19} = 10.5\%$	11. Combined Probability: $\frac{13}{204} = 6.4\%$	12. Combined Probability: $\frac{1}{16} = 6.3\%$