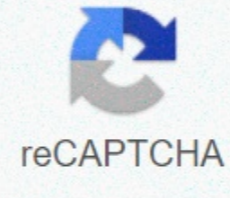




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## Probability addition and multiplication rule worksheet

Experiment: a single six-sided die is rolled. What is the probability of rolling a 2 or 5? Options: 1. The number can be 2. 2. The number can be 7. 3. The number can be 12. 4. The number can be 10. 5. The number can be 11. Events: These events are mutually exclusive because they cannot occur at the same time. Probabilities: How do we find the probabilities of these mutually exclusive events? We need a rule to guide us. Additional rule 1: If two events, A and B, are mutually exclusive, the probability of A or B is the sum of the probability of each event.  $P(A \text{ or } B) = P(A) + P(B)$  Use this add rule to find the probability of attempt 1.1th experiment: a single 6-sided die is rolled up. What is the probability of rolling a 2 or 5? Probabilities:  $P(2) = \frac{1}{6}$   $P(5) = \frac{1}{6}$   $P(2 \text{ or } 5) = P(2) + P(5) = \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$  Trial 2: Spinner has 4 identical sectors colour yellow, blue, green and red. What is the probability of landing on red or blue after rotating this revolution? Probability:  $P(\text{red}) = \frac{1}{4}$   $P(\text{blue}) = \frac{1}{4}$   $P(\text{red or blue}) = P(\text{red}) + P(\text{blue}) = \frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$  Experiment 3: Glass container contains 1 red, 3 green, 2 blue and 4 yellow marble. If one marble is selected at random from a glass, what is the likelihood of it being yellow or green? Probabilities:  $P(\text{yellow}) = \frac{4}{10}$   $P(\text{green}) = \frac{3}{10}$   $P(\text{yellow or green}) = P(\text{yellow}) + P(\text{green}) = \frac{4}{10} + \frac{3}{10} = \frac{7}{10}$  In each of the three experiments mentioned above, the events are mutually exclusive. Let's take a look at some experiments in which events are not mutually exclusive. Experiment 4: A single card is selected at random from the standard deck of 52 playing cards. What are the odds of choosing a king or club? Probabilities:  $P(\text{king or club}) = P(\text{king}) + P(\text{club}) - P(\text{king of clubs}) = \frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \frac{4}{13}$  In experiment 4 events are not mutually exclusive. The supplement causes the king of clubs to be counted twice, so his probability must be deducted. Where two events are non-exclusive, a different add rule should be applied. Additional rule 2: Where two events, A and B, are not mutually exclusive, the probability of A or B:  $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$  In the above rule,  $P(A \text{ and } B)$  refers to the overlap of two events. Let's apply this rule to some other experiments. Experiment 5: In math class 30 students, 17 are boys and 13 are girls. On the unit test, 4 boys and 5 girls did an A grade. Probabilities:  $P(\text{girl or A}) = P(\text{girl}) + P(A) - P(\text{girl and A}) = \frac{13}{30} + \frac{9}{30} - \frac{5}{30} = \frac{17}{30}$  Experiment 6: On new year, the probability of a person having a car crash is 0.09. V the probability of a traffic accident is 0.32 and the probability of a traffic accident is 0.15. What is the likelihood of a person driving during a viability or a car accident? Probabilities:  $P(\text{vited or accident}) = P(\text{vivien}) + P(\text{accident}) - P(\text{vivien and accident}) = 0.32 + 0.09 - 0.15 = 0.26$  Summary: In search of the probability of event A or B, it is first necessary to determine whether the events are mutually exclusive or not mutually exclusive. We can then apply the appropriate add rule: Additional rule 1: When two events, A and B, are mutually exclusive, the probability of each event is the probability of each event.  $P(A \text{ or } B) = P(A) + P(B)$  Additional rule 2: When two events, A and B are not excluded, there is some overlap between these events. The probability of aE or B is the sum of the probability of each event, less the probability of overlap.  $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$  Tutorial Instructions: Read each question below. Select a response by clicking on its button. Feedback on your response is available in the RESULTS BOX. If you make an error, select a different button. 1. The day of the week is selected at random. What are the odds of choosing Monday or Tuesday? 2. In the pet store there are 6 puppies, 9 kittens, 4 gerbils and 7 parakeets. If a pet is selected at random, what is the likelihood of choosing a puppy or package? 3. The probability of a New York teenager owning a skateboard is .37, the owner of the bike is .81 and the owner of both is 0.36. If the New York teenager is selected at random, what is the likelihood that a teenager owns a skateboard or a bicycle? 4. The number 1 to 10 shall be selected at random. What is the probability of selecting 5 or integer? 5. A single 6-sided die twists. What is the probability of rolling a number greater than 3 or a judicial number? What is the probability rule for multiplication? If you recall, we discussed the likelihood and its rules quite in depth. With the concept of probability that center position in statistics, learning about its rules are as important as learning about the concept. If probability is something you find difficult and afraid to deal with, we tell you that if you learn about its rules, you will better understand the probability. The multiplication rule specifies that:  $P(A \text{ and } B) = P(A) * P(B|A)$  or  $P(B) * P(A|B)$  In the above rule, if A and B are two independent events, the formula may be down;  $P(A \text{ and } B) = P(A) * P(B)$  Independent events refer to events that are not affected by the occurrence or event of another event. For example, if the two coins turn together, the second flip has the option of 0.50% of the landing in the first switch. What's the likelihood of having a tail in the first flip and your head in the second when you flip the coins twice? A large selection of lessons and worksheets that show students how to use and apply the probability rule for multiplication. Click Here to upgrade We see several different forms of probability floating around these problems. Homework 1 - Kitty has a bag with kids. The bag has 6 blue, 4 white and 9 purple colors. She takes one and takes her color. Then put it in the bag. Then draw another color. What is the likelihood of being out blue coloured, followed by a white colored toy? Homework 2 - Cheri has a box of 8 blue balls and 4 red balls. Two bullets are drawn in the box without being replaced. What are the odds that both bullets are blue? Homework 3 - David has a basket of caps. There are 6 red caps, 3 yellow caps and 7 green caps in the basket. She takes one hat and takes her paint and returns it to the basket. Then he draws another hat. What are the odds of pulling out yellow hats followed by a red cap? In these problems you will find a mixture of 3, 4 and 5 variables. Practice 1 - Mia has a box of pencils. The box contains 12 red pencils, 14 yellow pencils and 10 green pencils. One pencil writes the paint and returns it to the box. Then he draws another pencil. What are the odds of taking a red pencil followed by a green pencil? Practice 2 - Julia has a bag with 10 pink hankies and 8 white hankies. Two hankies are pulled out of the bag without a replacement. What's the likelihood that both junkies are white? Practice 3 - Liam has a box of lids. The box contains 6 yellow lids, 8 green lids and 10 blue lids. He randomly takes one hat out of the box. He imitates the color and returns it to the box. Then he draws another hat. What's the likelihood of taking a blue hat followed by a yellow cap? Make sure you pay attention if the item is replaced after it is selected. Quiz 1 - Jacob has a bag of hair straps. The bag has 10 red hair straps, 9 green hair straps and 5 orange hairs. She pulls out one headband, hinges her colored hair band and returns it to the bag. Then he draws another headband. What is the likelihood of taking out a red haired ribbon followed by a green headband? Quiz 2 - Lima has a box of 10 orange pens and 8 blue pens. Two pens are removed from the carton without replacement. What are the odds that both pencils are orange? Quiz 3 - Alex has a box of mobile phones. The box contains 5 green mobile, 10 red and 8 pink mobile. He takes one cell phone, writes down his color, and returns it to the box. Then he draws another cell phone. What's the likelihood of taking a red cell phone followed by a pink cell phone? Mobile?

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