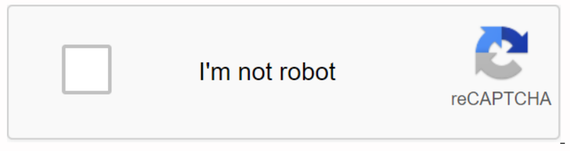

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Probability determining probabilities worksheet answers

Goal: I know how to find the probability of an event. In an experiment, an event is the result we are interested in. Probability event A, written P(A), is defined as P(A) = Read lessons on probability for more information and examples. Fill in all the gaps, then press Check to check your answer. Use the Hints button to get a free letter if the answer gives you a problem. You can also click the [?] button to get instructions. Note that you will lose points if you ask for directions or hints! Try the free Mathway calculator and troubleshooter below to practice a variety of math topics. Try the example given, or type your own problem and check your answers with a step-by-step explanation. We welcome your feedback, comments and questions about this site or page. Please send us your feedback or questions via our Feedback page. • how to draw a probability tree diagram for an independent event (with replacement) • how to draw a probability tree diagram for dependent events (without replacement) What is the Probability Tree Diagram? We can build a probability tree diagram to help us solve some probability problems. The probability tree diagram shows all possible events. The first event is represented by a point. From the point, the branch is drawn to represent all possible event results. The probability of each result being written on its branch. Example: The bag contains 3 black balls and 5 white balls. Paul picks up the ball randomly from the bag and replaces it back into the bag. He mixes the ball in the bag and then selects another ball randomly from the bag. a) Build a problem probability tree. b) Calculate the probability selected Paul: i) two black balls ii) black balls in the second draw Solution: a) Check if the probability in the last column adds up to 1. b) i) To find the possibility of getting two black balls, first find branch B and then follow the second B branch. Since this is an independent event, we can multiply the probability of each branch. ii) There are two results where the second ball can be black. Either (B, B) or (W, B) From the probability tree diagram, we get: P(black second ball) = P(B, B) or P(W, B) = P(B, B) + P(W, B) Example: Bag A contains 10 marbles of which 2 are red and 8 are black. Bag B contains 12 marbles, 4 of which are red and 8 are black. A ball is drawn randomly from each bag. a) Draw a probability tree diagram to show all the results of the experiment. b) Find the probability that: (i) both are red. (ii) both are black. (iii) one black and one red. (iv) at least one red. Solution: a) Probability tree diagram showing all the results of the experiment. b) Probability: (i) both are red. P(R, R) = (ii) both Black. P(B, B) = (iii) one black and one red. P(R, B) or P(B, R) = (iv) at least one red. 1- P(B, B) = Example: The box contains 4 red chips and 2 blue. The chip is drawn randomly and then replaced. The second chip is then drawn randomly. a) Show all results using a probability tree diagram. b) Calculate the probability of getting: (i) at least one blue. (ii) one red and one blue. (iii) two of the same color. Solution: a) A probability tree diagram to show all possible results. b) Probability of getting: (i) at least one blue. P(R, B) or P(B, R) or P(B, B) = (ii) one red and one blue. P(R, B) or P(B, R) = (iii) two of the same color. P(R, R) or P(B, B) = How to solve probability problem using probability tree diagram? Example: Coins are biased so have a 60% chance of landing on the head. If thrown three times, find the possibility of getting) three heads b) 2 heads and a tail c) at least one head Show Solution Step by step How to use a tree diagram to calculate the combined probability of two independent events? Example: Jerry has a bag with seven blue candies and 3 red candies in it. She takes the sweet randomly from the bag, replaces it and then picks it up again at random. Draw a tree diagram to represent this situation and use it to calculate the probability of him choosing: (a) two red candies (b) no red candy (c) at least one blue candied (d) one sweet from each color Show Solution Step by step How to use a probability tree diagram to calculate the probability of two events that are not independent? Example: Jimmy has a bag with seven blue candy and 3 red candies in it. She takes the sweet randomly from the bag, but doesn't replace it and then picks it up again at random. Draw a tree diagram to represent this situation and use it to calculate the probability it chooses: (a) two red candies (b) no red candy (c) at least one sweet candied (d) one sweet from each color Show Solution Step by step How to use a probability tree diagram to calculate the probability of two dependent events? Example: In the bag there are 3 green balls, 2 red balls and and 4 yellow balls. Two balls are drawn randomly without a replacement. Calculate the probability of drawing one red ball and one yellow ball. Show Step by Step Solution Try the free Mathway calculator and troubleshooter below to practice a variety of math topics. Try the example given, or type your own problem and check your answers with a step-by-step explanation. We welcome your feedback, comments and questions about this site or page. Please send us your feedback or questions via our Feedback page. Besides Algebra, I can't think of a math topic that I enjoy teaching more than probability. Students intuitively understand the possibility of something happening or not happening. Probability studies lend themselves to many real-life applications, from making data-driven predictions, to creating winning strategies while playing games. Worksheets This free introduces students to the basic ideas behind probability. They will learn how to describe the probability of events using numbers from 0 to 1. They will analyze real-life word problems to calculate experimental and theoretical probabilities. Plus Plus see how complementary events relate to other results. Most problems incorporate traditional probability concepts such as spinners, coins, and dice. Each worksheet complies with the General Core Standards of Mathematics (most grades 6 and grade 7 at this time). All worksheets include free answer buttons and can be customized to match any level of value. Thank you for visiting www.mathworksheets.com! Theoretical Probability Worksheet 1 - Here is a fifteen problem worksheet in which students will learn to use fractions to decipher the probability of an event. A line of numbers is included to help students determine whether an event is impossible, impossible, equally possible, possible, or definitive. Theoretical Probability Worksheet 1 RTF Theoretical Probability Worksheet 1 PDF Preview 1 Theoretical Probability Worksheet in Your Web Browser View Answers Theoretical Probability Worksheet 2 - Here are fourteen problem worksheets where you will calculate the theoretical probability of an event. You'll specify the total number of results in each situation, and then decide how many results match the results you want. Finally, you will express the probability as a number between 0 and 1. Theoretical Probability Worksheet 2 RTF Theoretical Probability Worksheet 2PDF Preview 2 Theoretical Probability Worksheets in Your Web Browser View Answer Probabilities & Worksheet Complement 3 - Here are thirteen problem worksheets in which students will analyze the events and their appendages. They will calculate the probability for the desired result as well as its complement. Some exercises show the total number of results, others require students to do a little simple arithmetic. Probability & Complementary Worksheet 3 RTF Probability & Complete Worksheet 3 PDF Probability & Complement Worksheet 3 in your Web Browser View Home answer/math/probability calculator To find out the unity, intersection, and other related probabilities of two independent events. Please enter a value between 0 and 1. Please provide the 2 values below to calculate the probability of remaining two independent events. Please enter a value between 0 and 1. Use the calculator below to find the P area shown in the normal distribution, as well as confidence intervals for different levels of confidence. Related StandardIzed Deviation Calculator | Sample Size Calculator | The Probability Calculator Of Two-Event Probability Statistics is a measure of the likelihood of an event occurring. This is measured as a number between 0 and 1, with 1 indicating certainty, and 0 indicating that the event cannot occur. It follows that the higher the probability of an event, the more certain it will be. In the case of generally, probability can be defined numerically because the number of desired results is divided by the total number of results. This is increasingly influenced by whether the events studied are independent, mutually exclusive, or conditional, among others The given calculator calculates the probability that events A or B do not occur, probabilities A and /or B occur when they are not mutually exclusive, the probability that events A and B occur, and the likelihood that event A or event B occurs, but not both. Appendages A and B Given probability A, which is marked with P(A), it is easy to calculate the appendage, or the probability that the event described by P(A) did not occur, P(A'). If for example P(A) = 0.65 represents the probability that Bob is not doing his homework, his teacher Sally can predict the probability that Bob is doing his homework as follows: P(A') = 1 - P(A) = 1 - 0.65 = 0.35 Given this scenario, therefore there is a 35% chance of Bob doing his homework. Each P(B') will be calculated in the same way, and it should be noted that in the calculator above, it can be independent; i.e. if P(A) = 0.65, P(B) does not have to be equal to 0.35, and can be equal to 0.30 or some other number. Junctions A and B Junctions of events A and B, written as P(A ∩ B) or P(A AND B) are a shared probability of at least two events, shown below in the Venn diagram. In cases where A and B are mutually exclusive events, P(A ∩ B) = 0. Consider the possibility of rolling 4 and 6 on one dead scroll; That's not possible. Therefore, these events will be considered mutually exclusive. Computing P(A ∩ B) is simple if the event is independent. In this case, the probability of events A and B is multiplied. To find the probability that two separate rolls of death produce 6 each time: The calculator provided considers cases where probability is independent. Calculating probability is slightly more involved when an event depends, and involves an understanding of conditional probability, or probability of event A considering event B has occurred, P(A| B). Take for example a bag of 10 marbles, 7 of which are black, and 3 of them are blue. Calculate the probability of drawing a black marble if the blue marble has been pulled without replacement (blue marble is removed from the bag, reducing the total number of marbles in the bag): Probability of drawing blue marble: P(A) = 3/10 Probability of drawing black marble: P(B) = 7/10 Probability of drawing black marble given that blue marble is drawn: P(B| A) = 7/9 As can be seen, the probability that the drawn black marble is affected by the previous event in which the black or blue marble is drawn without a replacement. So, if one wants to determine the possibility of pulling blue marbles and then black from the bag: Probability of drawing blue marble and then black using the probability calculated above: P(A ∩ B) = P(A) × P(B| A) = (3/10) × (7/9) = 0.2333 Unity A and B In probability, event unification, P(A U B), essentially involves a condition in which any or all events are being considered shown in the Venn diagram below. Note that P(A U B) can also be written as OR B). In this case, inclusive OR is being used. This means that although at least one of the conditions in the union must apply, all conditions can be simultaneously correct. There are two cases for unity of events; these events are mutually exclusive, or the events are not mutually exclusive. In cases where events are mutually exclusive, the probability calculation is simpler: The basic example of an inter-exclusive event is the rolling of the dice where event A is the probability that an even number is scrolled, and event B is the probability that the odd number is scrolled. It is clear in this case that the events are mutually exclusive because the numbers should not be even and odd, so P(A U B) will be 3/6 + 3/6 = 1, since the standard dice only have odd and even numbers. The above calculator calculates other cases, where events A and B are not mutually exclusive. In this case: P(A U B) = P(A) + P(B) - P(A ∩ B) Using the example of rolling the dice again, find the probability that an even number or number that is a multiple of 3 is rolled. Here the set is represented by 6 dice values, written as: S = {1,2,3,4,5,6} Probability of even numbers:P(A) = {2,4,6} = 3/6 Probability multiples 3:P(B) = {3.6} = 2/6 6 Deviated Siur A and B: P(A ∩ B) = {6} = 1/6 P(A U B) = 3/6 + 2/6 -1/6 = 2/3 Exclusive OR of A and B Another possible scenario that the calculator may do above is P(A XOR B), shown in the Venn diagram below. The Exclusive OR operation is defined as an A or B event, but not simultaneously. The equation is as follows: For example, imagine it's Halloween, and two buckets of candy are set up outdoors, one contains Snickers, and the other contains Reese. A few flashing neon signs placed around the candy bucket insist that every trick-or-treater only takes one Snickers OR Reese but not both! It is unlikely, however, that each child adheres to the flashing neon signs. Given the probability of Reese being selected as P(A) = 0.65, or Snickers selected with P(B) = 0.349, and P(unlikely) = 0.001 that a child does restraint while considering the loss of a potential future cavity, calculate the probability that Snickers or Reese was chosen, but not both: 0.65 + 0.349 - 2 × 0.65 × 0.349 = 0.999 - 0.4537 = 0.5453 Therefore, there is a 54.53% chance that Snickers or Reese is chosen, but not both. Normal Distribution Normal distribution or Gaussian distribution is a continuous probability distribution that follows the function: where μ is average and σ2 is variance. Note that the default deviation is usually marked as σ. Also, in special cases in μ = 0 σ = 1, the distribution is referred to as the standard normal distribution. Above, along with the calculator, is a typical normal distribution curve chart. Normal distribution is often used to describe and estimate any variables that are likely to be For example, the height of male students in college, the size of the leaves in the tree, the test score, etc. Use the Normal Distribution calculator above to determine the probability of an event with a normal distribution located between two given values (i.e. P in the diagram above); for example, the high probability of male students is between 5 and 6 feet in college. Finding P as shown in the diagram above involves standardizing the two desired values to a z-score by subtracting the given average and dividing by the standard deviation, as well as using table Z to find the probability for Z. If for example it is desirable to find the probability that a student at the university has a height of between 60 inches and a height of 72 inches given an average of 68 inches high with standard deviations of 4 inches, 60 and 72 inches will be standardized such as: Given μ = 68; σ = 4 (60 - 68)/4 = -8/4 = -2(72 - 68)/4 = 4/4 = 1 The above graph describes the area of interest in the normal distribution. To determine the probability represented by the shadow area of the chart, use the standard normal Z table provided at the bottom of the page. Note that there are different types of standard normal Z tables. The table below provides the probability that the statistics are between 0 and Z, where 0 is the average in the standard normal distribution. There are also Z-tables that provide z left or right probabilities, both of which can be used to calculate the desired probability by subtracting the relevant values. For this example, to determine the probability of a value between 0 and 2, find 2 in the first column of the table, because the table by this definition provides a probability between the average (i.e. 0 in the standard normal distribution) and the number of options, in this case 2. Note that because the value in question is 2.0, the table is read by queuing row 2 with column 0, and reading the values in it. If instead the value in question is 2.11, row 2.1 will be matched with column 0.01 and the value is 0.48257. Also note that although the actual interest value is -2 on the chart, the table only provides a positive value. Because the normal distribution is symmetrical, only displacement is important, and the displacement of 0 to -2 or 0 to 2 is the same, and will have the same area below the curve. Thus, the probability of the value falling between 0 and 2 is 0.47725, while a value between 0 and 1 has a probability of 0.34134. Since the desired area is between -2 and 1, the probability is added to the yield of 0.81859, or about 81.859%. Going back to the example, this means that there is an 81.859% chance in this case that a male student at a particular university has a height of between 60 and 72 inches. The calculator also provides confidence interval tables for different levels of confidence. See Sample Size Calculator for Proportions for a more detailed explanation of intervals and confidence levels. Trust intervals are a way of estimating population parameters that provide interval parameters rather than a single value. Confidence intervals are always qualified by confidence levels, usually expressed as percentages such as 95%. This is an indicator of approximate reliability. Table Z of Average (0 to Z) Z)