

## Conditional probability practice worksheet



- If  $A$  is the event that an astronaut is a member of the armed services,  $T$  is the event that he or she was once a test pilot, and  $S$  is the event that he or she is a scientist, express each of the following probabilities symbolically.
  - the probability that an astronaut who was once a test pilot is a member of the armed services
  - the probability that an astronaut who is a member of the armed services is a scientist but was never a test pilot
  - the probability that an astronaut who is not a scientist was once a test pilot
  - the probability that an astronaut who is a member of the armed services but was never a pilot is a scientist

- There are 60 qualified applicants for teaching positions in a high school, of which some have had at least five years' teaching experience and some have not, some are married and some are single, with the exact breakdowns being

At least five years teaching experience	Married		Single
	12	6	
Less than five years teaching experience	24	18	

If the order in which the applicants are interviewed by the principal is random,  $M$  is the event that the first applicant interviewed is married, and  $F$  is the event that the first applicant interviewed will have had at least five years' teaching experience, determine the following probabilities from the table.

- $P(M)$
- $P(F)$
- $P(M \cap F)$
- $P(M \cap F^c)$
- $P(M^c \cap F)$
- $P(M^c \cap F^c)$

**Conditional Probability Worksheet**

Most of the questions here were asked from a worksheet, not written by me.

$P(A) = 0.4$ ,  $P(B) = 0.2$ ,  $P(A \cap B) = 0.1$ . Calculate the probability that

- both  $A$  and  $B$  occur
- at least one of the events occurs
- neither  $A$  nor  $B$  occurs
- $A$  or  $B$  occurs given  $A$  occurs

23. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a red card?

24. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a face card?

25. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10?

26. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value greater than 10?

27. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a face card?

28. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value greater than 10 and is a face card?

29. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a card with a value greater than 10?

30. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a card with a value greater than 10 and is a face card?

31. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a card with a value greater than 10 and is a card with a value less than 10 and is a face card?

32. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a card with a value greater than 10 and is a card with a value less than 10 and is a card with a value greater than 10 and is a face card?

**CONDITIONAL PROBABILITY**  
Student Worksheet

**Question 1**

1. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a red card?

2. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a face card?

**Question 2**

3. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10?

4. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value greater than 10?

5. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a face card?

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8. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a card with a value greater than 10 and is a face card?

9. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a card with a value greater than 10 and is a card with a value less than 10 and is a face card?

10. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a card with a value greater than 10 and is a card with a value less than 10 and is a card with a value greater than 10 and is a face card?

- The Franklin Park Zoo is randomly deciding on one new animal to bring to their zoo: a Nile Crocodile, a Bengal Tiger, a Burmese Python, a Polar Bear, a Jaguar, or a Tortoise, a Bull Shark, or a Killer Whale.

- What is the probability that they choose a Python, given that the animal they select is a reptile? \_\_\_\_\_
- What is the probability that they choose a Tortoise given that the animal they select lives in a water-based habitat? \_\_\_\_\_

- The Red Sox game tonight has a 40% chance of being rained out due to rain, and a 25% chance of being rained out if there's just heavy fog. There is a 30% chance of there being just heavy fog tonight, and a 70% chance of rain.

- Draw a tree diagram to model this situation.
- Find the probability that the game will be canceled. \_\_\_\_\_
- Find the probability that there will be rain and the game will. \_\_\_\_\_

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**Conditional Probability Worksheet**

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10. (Hard) A card is dealt at random from a standard 52-card deck. What is the probability that the card is a heart given that it is a card with a value less than 10 and is a card with a value greater than 10 and is a card with a value less than 10 and is a card with a value greater than 10 and is a face card?

In this worksheet, we will practice calculating conditional probability using formulas and Venn diagrams. This lesson includes 49 additional questions and 147 additional question variations for subscribers. Math worksheets and visual curriculum (1) Can two events be mutually exclusive and independent simultaneously? Solution(2) If A and B are two events such that  $P(A \cup B) = 0.7$ ,  $P(A \cap B) = 0.2$ , and  $P(B) = 0.5$ , then show that A and B are independent. Solution(3) If A and B are two independent events such that  $P(A \cup B) = 0.6$ ,  $P(A) = 0.2$ , find  $P(B)$ . Solution(4) If  $P(A) = 0.5$ ,  $P(B) = 0.8$  and  $P(B|A) = 0.8$ , find  $P(A|B)$  and  $P(A \cup B)$ . Solution(5) If for two events A and B,  $P(A) = 3/4$ ,  $P(B) = 2/5$  and  $A \cup B = S$  (sample space), find the conditional probability  $P(A|B)$ . Solution(6) A problem in Mathematics is given to three students whose chances of solving it are  $1/3$ ,  $1/4$  and  $1/5$  (i) What is the probability that the problem is solved? (ii) What is the probability that exactly one of them will solve it? Solution(7) The probability that a car being filled with petrol will also need an oil change is 0.30; the probability that it needs a new oil filter is 0.40; and the probability that both the oil and filter need changing is 0.15. (i) If the oil had to be changed, what is the probability that a new oil filter is needed?(ii) If a new oil filter is needed, what is the probability that the oil has to be changed? Solution(8) One bag contains 5 white and 3 black balls. Another bag contains 4 white and 6 black balls. If one ball is drawn from each bag, find the probability that (i) both are white (ii) both are black (iii) one white and one black. Solution(9) Two thirds of students in a class are boys and rest girls. It is known that the probability of a girl getting a first grade is 0.85 and that of boys is 0.70. Find the probability that a student chosen at random will get first grade marks. Solution(10) Given  $P(A) = 0.4$  and  $P(A \cup B) = 0.7$ . Find  $P(B)$  if (i) A and B are mutually exclusive (ii) A and B are independent events (iii)  $P(A|B) = 0.4$  (iv)  $P(B|A) = 0.5$ . Solution(11) A year is selected at random. What is the probability that (i) it contains 53 Sundays (ii) it is a leap year which contains 53 Sundays. Solution(12) Suppose the chances of hitting a target by a person X is 3 times in 4 shots, by Y is 4 times in 5 shots, and by Z is 2 times in 3 shots. They fire simultaneously exactly one time. What is the probability that the target is damaged by exactly 2 hits? Solution Kindly mail your feedback to v4formath@gmail.com We always appreciate your feedback. ©All rights reserved. onlinemath4all.com September 4, 2019 corbettmaths This is a really fun worksheet that can be used to solve three problems as a class. Example exercise: Consider the game in which there are three doors (numbered 1, 2, 3), one of which has a car behind it and two of which are empty. Max initially selects Door 1, then, before it is opened, Monty Hall tells you that Door 3 is empty. Max is then given the option to switch your selection from Door 1 to the unopened Door 2. What is the probability that Max will win the car if you switch your door selection to Door 2? Page 2 [Home] This worksheet is a PDF document. You will need Adobe Acrobat Reader to view the worksheet or answers. Each worksheet may consist of several pages, scroll down to the see everything.

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