

11.4.1: Conditional Probability (Exercises)

SECTION 11.4 PROBLEM SET: CONDITIONAL PROBABILITY

Questions 1 - 4: Do these problems using the conditional probability formula: $P(A|B) = \frac{P(A \cap B)}{P(B)}$.

1. A card is drawn from a deck. Find the conditional probability of $P(\text{a queen} \text{a face card})$.	2. A card is drawn from a deck. Find the conditional probability of $P(\text{a queen} \text{a club})$.
3. A die is rolled. Find the conditional probability that it shows a three if it is known that an odd number has shown.	4. If $P(A) = .3$, $P(B) = .4$, $P(A \text{ and } B) = .12$, find: a. $P(A B)$ b. $P(B A)$

Questions 5 - 8 refer to the following: The table shows the distribution of Democratic and Republican U.S. Senators by gender in the 114th Congress as of January 2015.

	MALE(M)	FEMALE(F)	TOTAL
DEMOCRATS (D)	30	14	44
REPUBLICANS(R)	48	6	54
OTHER (T)	2	0	2
TOTALS	80	20	100

Use this table to determine the following probabilities:

5. $P(M D)$	6. $P(D M)$
7. $P(F R)$	8. $P(R F)$

Do the following conditional probability problems.

9. At a college, 20% of the students take Finite Math, 30% take History, and 5% take both Finite Math and History. If a student is chosen at random, find the following conditional probabilities. a. He is taking Finite Math given that he is taking History. b. He is taking History assuming that he is taking Finite Math.	10. At a college, 60% of the students pass Accounting, 70% pass English, and 30% pass both of these courses. If a student is selected at random, find the following conditional probabilities. a. He passes Accounting given that he passed English. b. He passes English assuming that he passed Accounting.
11. If $P(F) = .4$, $P(E F) = .3$, find $P(E \text{ and } F)$.	12. $P(E) = .3$, $P(F) = .3$; E and F are mutually exclusive. Find $P(E F)$.
13. If $P(E) = .6$, $P(E \text{ and } F) = .24$, find $P(F E)$.	14. If $P(E \text{ and } F) = .04$, $P(E F) = .1$, find $P(F)$.

At a college, 72% of courses have final exams and 46% of courses require research papers. 32% of courses have both a research paper and a final exam. Let F be the event that a course has a final exam and R be the event that a course requires a research paper.

15. Find the probability that a course has a final exam given that it has a research paper.	16. Find the probability that a course has a research paper if it has a final exam.
---	---

SECTION 11.4 PROBLEM SET: CONDITIONAL PROBABILITY

Consider a family of three children. Find the following probabilities.

17. $P(\text{two boys} \text{first born is a boy})$	18. $P(\text{all girls} \text{at least one girl is born})$
---	--

19. $P(\text{children of both sexes} \mid \text{first born is a boy})$

20. $P(\text{all boys} \mid \text{there are children of both sexes})$

Questions 21 - 26 refer to the following:

The table shows highest attained educational status for a sample of US residents age 25 or over:

	(D) Did not Complete High School	(H) High School Graduate	(C) Some College	(A) Associate Degree	(B) Bachelor Degree	(G) Graduate Degree	TOTAL
25-44 (R)	95	228	143	81	188	61	796
45-64 (S)	83	256	136	80	150	67	772
65+ (T)	96	191	84	36	80	41	528
Total	274	675	363	197	418	169	2096

Use this table to determine the following probabilities:

21. $P(C T)$	22. $P(S A)$	23. $P(C \text{ and } T)$
24. $P(R B)$	25. $P(B R)$	26. $P(G S)$

This page titled [11.4.1: Conditional Probability \(Exercises\)](#) is shared under a [CC BY 4.0](#) license and was authored, remixed, and/or curated by [Rupinder Sekhon and Roberta Bloom](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.

- **8.4.1: Conditional Probability (Exercises)** by [Rupinder Sekhon and Roberta Bloom](#) is licensed [CC BY 4.0](#). Original source: <https://www.deanza.edu/faculty/bloomroberta/math11/afm3files.html.html>.