13.3 Conditional Probability and Intersections of Events

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Key Terms:

Conditional Probability
Probability Tree
Independent and Dependenent Events

Name:_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the indicated probability.

1) You roll two fair dice. Let E be the event that an even total shows on the dice. Let F be the event that a two shows on at least one of the dice. Find P(F) and P(F|E).

2) A box contains 24 blue marbles, 13 green marbles, and 13 red marbles. Two marbles are selected at random without replacement. Let E be the event that the first marble selected is green. Let F be the event that the second marble selected is green. Find P(F|E) .

3) A single card is drawn from a standard 52-card deck. Find P(diamond | red).

4) A single card is drawn from a standard 52-card deck. Find P(jack | face card).

5) The following table relates the grades in an advanced mathematics course to the student's year in college:

	A	B	C	D	E	Totals (%)
Freshmen	1	5	6	4	1	17
Sophomores	6	5	8	2	3	24
Juniors	5	7	12	6	2	32
Seniors	5	4	1	3	5	18
Grad Students	5	2	2	0	0	9
Totals (%)	22	23	29	15	11	100

Let E be the event that the student received a grade of B. Let F be the event that the student is a sophomore. Find P(F|E).

6) The following table relates the grades in an advanced mathematics course to the student's year in college:

	A	B	C	D	E	Totals (%)
Freshmen	3	5	6	4	1	19
Sophomores	6	6	8	2	3	25
Juniors	5	7	9	6	2	29
Seniors	5	4	1	5	5	20
Grad Students	3	2	2	0	0	7
Totals (%)	22	24	26	17	11	100

Let E be the event that the student received a grade of B. Let F be the event that the student is a sophomore. Find P(F|E).

Imagine that you are taking part in a study to test a new cold medicine. Although you don't know exactly what drug you are taking, the probability that it is drug A is 30%, that it is drug B is 10%, and that it is drug C, 60%. From past clinical trials, the probabilities that these drugs will improve your condition are: A (20%), B (50%), and C (70%).

7) What is the probability that you will improve given that you are taking drug A?

8) What is the probability that you will improve?

9) If you improve, what is the probability that you are taking drug B?

Answer the question.

10) A pair of fair dice are rolled. Let E be the event that the sum is less than ten. Let F be the event that at least one die shows a six. Are E and F dependent events?

11) A pair of fair dice are rolled. Let E be the event that a one shows on the second die. Let F be the event that the total showing is even. Are E and F dependent events?

Solve the problem.

12) A survey revealed that 43% of people are entertained by reading books, 26% by watching TV, and 14% are entertained by both books and TV. What is the probability that a person will be entertained by books or TV?