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Math_Questions_0051

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1. Let S = {Ann, Dan, Fran, Jim, Joe, Kim}, A = {Jim, Joe, Kim}, B = {Ann, Dan, Fran}, and
   C = {Dan, Jim, Joe}.

   a. Find $(A \cap C)'$
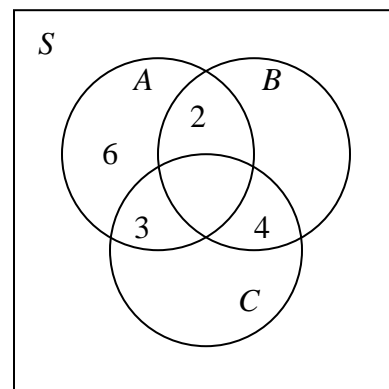
   b. Find $n(A \cup C)$

2. An employee i.d. at a company consists of 2 letters, followed by 4 or 5 digits (0 – 9) with repetition allowed.
   How many employee i.d.'s are possible?

3. A loaded die is rolled repeatedly with the results listed in the table. Estimate the probability of rolling a 2 or
   3 on this die.

number rolled	1	2	3	4	5	6
frequency	10	43	22	13	1	25

4. Use the given information to fill in the cardinalities of the each region in the Venn diagram.
   $n(A') = 21,\ n(C) = 20, n(A \cap C) = 8,\ n(A \cup B) = 25$

5. 70% of the students in a class passed an exam. 59% of the students had completed the practice test.
   48% of the students completed the practice test and passed the exam.
   Find the probability that a student passed the test given that the student completed the practice test.

6. A standard deck of 52 cards contains:

$$\text{Black cards:}\begin{cases}\text{Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King of Clubs}\\\text{Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King of Spades}\end{cases}$$

$$\text{Red cards:}\begin{cases}\text{Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King of Hearts}\\\text{Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King of Diamonds}\end{cases}$$

    a. If two cards are chosen at random from the deck, one at a time, without replacement, find the probability that the first card is an ace and the second is a jack.

    b. If two cards are picked at random from the deck, one at a time, with replacement, find the probability that the cards chosen are both hearts.

7. 75% of the households in a community have internet access. 83% of the households have a cell phone. 60% of the households have both. What percentage of the households has neither a cell phone nor internet access?

8. A lottery game has participants choose 4 different numbers from 0 – 29. The winner is someone who has chosen the correct sequence. Find the probability of winning this lottery.

9. An insurance company finds that 15% of their customers were in accidents this year. Of those, 65% had received a traffic ticket within the last 3 years. Of the people who had not been in an accident, 51% had received a traffic ticket within the last 3 years. Find the probability that a customer was in an accident this year given that he or she has received a traffic ticket within the last 3 years.
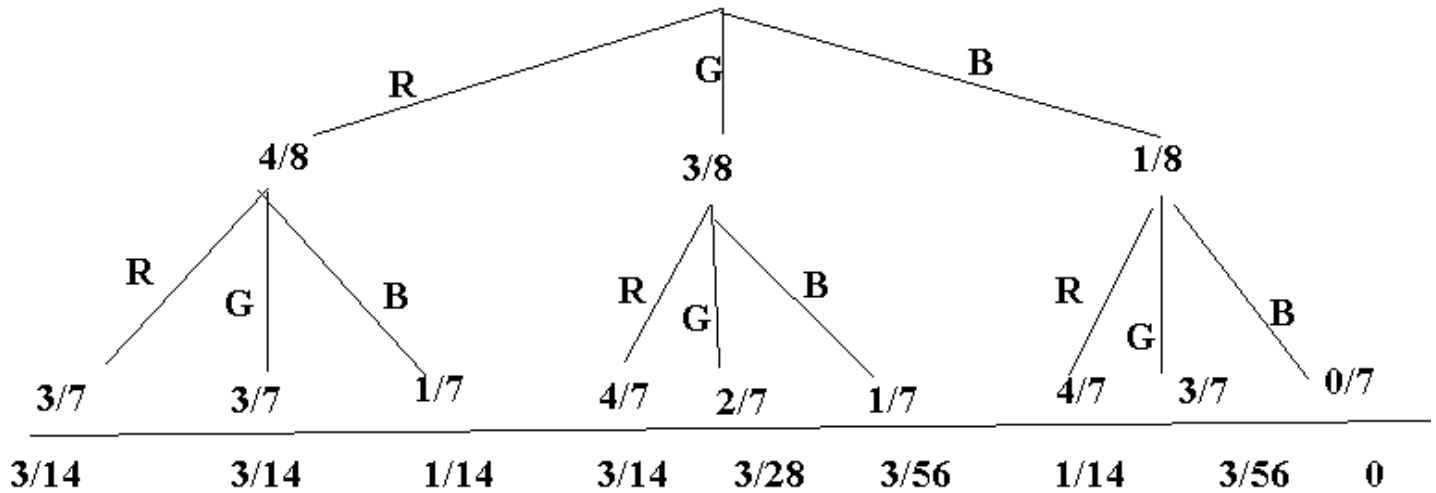
	Accident	No accident
Ticket	9.75%	43.35%
No ticket	5.25%	41.65%

10. A bowl contains 6 red, 3 green, 4 yellow and 2 orange marbles. A sample of 3 marbles is chosen at random from the bowl.

    a. Find the probability that the sample contains 2 red and 1 yellow marble.

    b. Find the probability that the sample does not include any red marbles.

12. There is a container that holds 4 red marbles, 3 green, and 1 blue marble. If two selections are made, create a tree diagram to depict this, if the draws are made without replacement. (make the WHOLE tree with branches, leaves and all of their corresponding probabilities. Now find the probability of getting a Blue on the first pick, knowing that you picked a Red on the second pick.

(diagram is on next page)

	R	G	B			
	4/8	3/8	1/8			

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        R    G    B        R    G    B        R    G    B
       3/7  3/7  1/7      4/7  2/7  1/7      4/7  3/7  0/7

      3/14 3/14 1/14     3/14 3/28 3/56     1/14 3/56  0
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11. At William Tysdall University all new freshmen are given an English placement exam. The top score on the exam is 40 points. The following table shows the range of scores on the placement exam and the final grade students got in their freshman composition course.

Score	A	B	C	D	F	Row Total
0-10	5	7	12	19	31	74
11-20	28	55	76	24	11	194
21-30	40	72	51	12	4	179
31-40	57	43	19	15	10	144
Column Totals	130	177	158	70	56	591

a. What is the probability that a student will get a "C"?

b. What is the probability that a student will get an "B" given that a score of 31-40 was achieved on the placement test?

c. What is the probability that a student scored between 21-30 **and** got a D in the course?

d. What is the probability that a student scored between an 11-20 knowing they received a "C" in the course?