Name: _____ Date: _____ Period: _____

Conditional Probabilities

1. Use the table below to find each probability for a randomly selected employee:

EDUCATION AND SALARY OF EMPLOYEES			
	Under $20,000	$20,00 to $30,000	Over $30,000
Less than high school	69	36	2
High School	112	98	14
Some College	102	193	143
College	13	173	245

    a) P(employee has less than a high school education)

    b) P(employee earns under $20,000)

    c) P(employee earns over $30,000 and has less than a high school education)

    d) P(employee earns under $20,000 and has a college degree)

    e) P(employee earns over $30,000 | has only high school education)

    f) P(employee has less than high school education | earns over $30,000)

2. Use the table to find each probability for a randomly chosen student.

    a) P(male)

GENDER AND COLLEGE MAJORS			
	Biology	Physics	Chemistry
Male	40	16	35
Female	15	24	20

    b) P(male or majors in Chemistry)

   **c)** P(majors in Physics | male)

3. Use the sample space {5, 6, 7, 8, 9, 10, 11, 12, 13, 14} to find the probability for a randomly selected #.

    a) P(integer)   **b)** P(less than 10 | less than 13)

    c) P(greater than 8 | less than 11)   **d)** P(greater than 7 | greater than 12)

4. a) Complete the tree diagram below showing the appropriate probabilities.

Maria travels to school either by walking or by bicycle. The probability she cycles to school is 0.75. If she walks, the probability that she is late for school is 0.1 and if she cycles, the probability that she is late for school is 0.05.
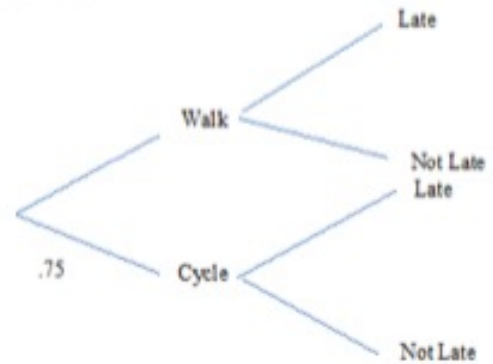
b) Find the probability that Maria is late for school.

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                                              Late
                          Walk
                                              Not Late
                                              Late
        .75          Cycle
                                              Not Late
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5. a) Complete the tree diagram below showing the appropriate probabilities.

Sharon and Lisa share an apartment. Sharon cooks dinner three nights out of ten. If Sharon does not cook dinner, then Lisa does. If Sharon cooks dinner the probability that they have pasta is 0.75. If Lisa cooks dinner the probability that they have pasta is 0.12.
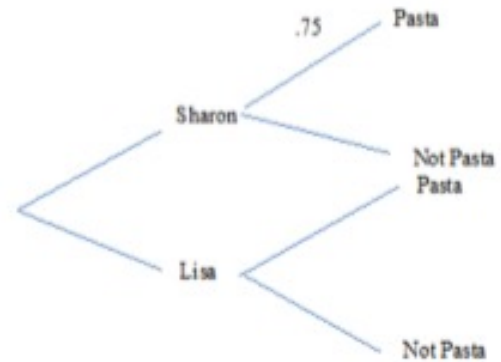
b) Find the probability that Lisa cooks dinner and they do not have pasta.

c) Find the probability they do not have pasta.

d) Given that they do not have pasta, find the probability that Lisa cooked dinner.

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                        .75          Pasta
              Sharon
                                     Not Pasta
                                     Pasta
              Lisa
                                     Not Pasta
```

6. The letters in the word **AARDVARK** are printed on square pieces of cardboard with one letter per card. The eight letters are placed in a hat and one letter is chosen at random. Find the following probabilities.

a) P(the letter chosen is a vowel | the letter falls in the first half of the alphabet)

b) P(the letter falls in the first half of the alphabet | letter chosen is a vowel)

Draw a tree diagram. Find each probability.

7. A softball game has an 80% chance of being canceled for a light drizzle and a 30% chance of being canceled for a heavy fog when there is no drizzle. There is a 70% chance of heavy fog and a 30% chance

a) Find the probability that the game will be canceled.

b) Find the probability there will be a light drizzle and the game will not be canceled.

8. Given two events X and Y: Event X has probability $\frac{5}{6}$. If event X happens, then the probability of
event Y is $\frac{2}{5}$. If event X does not happen, then the probability of event Y is $\frac{1}{4}$.

   a) Label each branch of this tree diagram with a probability. (Any probabilities that are
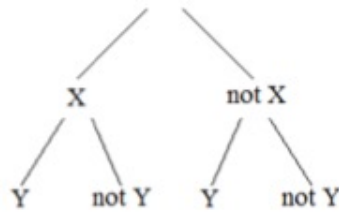   not already stated can be figured out from the given information.)

Find these probabilities.

   b) $P(\text{not } X) =$ **c)** $P(Y \mid (\text{not } X)) =$

   d) $P((\text{not } Y) \mid X) =$ **e)** $P(X \text{ and } Y) =$

   f) $P((\text{not } X) \text{ and } (\text{not } Y)) =$

9. High school students in one school
chose their favorite leisure activity.
Find each probability. Round to the
nearest tenth of a percent.

Favorite Leisure Activities

	Sports	Hiking	Reading	Texting	Shopping	Other
Female	39	48	85	62	71	29
Male	67	58	76	54	68	39

   a) $P(\text{sports} \mid \text{female})$ **b)** $P(\text{female} \mid \text{sports})$

   c) $P(\text{reading} \mid \text{male})$ **d)** $P(\text{male} \mid \text{reading})$ **e)** $P(\text{hiking} \mid \text{female})$

   f) $P(\text{hiking} \mid \text{male})$ **g)** $P(\text{male} \mid \text{shopping})$ **h)** $P(\text{female} \mid \text{shopping})$

10. The senior class is 55% female, and 32% are females who play a competitive sport. Find the probability
that a student plays a competitive sport, given that the student is female.