

PROBABILITY & STATISTICS

$\frac{\text{desired \#}}{\text{total \#}}$  Final Review-Conditional Probability.

Name Key Date \_\_\_\_\_ Period \_\_\_\_\_

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           |

107  
224  
438  
431  
1200

a)  $P(\text{employee has less than a high school education})$

$\frac{107}{1200} = 0.089$

b)  $P(\text{employee earns under } \$20,000)$

$0.247$

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

$\frac{2}{1200} = 0.002$

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

$0.011$

e)  $P(\text{employee earns over } \$30,000 \mid \text{has only high school education})$

$\frac{14}{224} = 0.0625$

f)  $P(\text{employee has less than high school education} \mid \text{earns over } \$30,000)$

$\frac{2}{404} = 0.00495$

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

a)  $P(\text{male}) = \frac{91}{150} = 0.607$

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

91  
59  
150

b)  $P(\text{male or majors in Chemistry})$

$\frac{91}{150} + \frac{55}{150} - \frac{35}{150} = \frac{111}{150} = 0.74$

c)  $P(\text{majors in Physics} \mid \text{male})$

$\frac{16}{91} = 0.176$

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

a)  $P(\text{integer}) = 100\%$

b)  $P(\text{less than } 10 \mid \text{less than } 13)$

$\frac{5}{8} = 0.625$

c)  $P(\text{greater than } 8 \mid \text{less than } 11)$

$\frac{2}{6} = 0.33$

d)  $P(\text{greater than } 7 \mid \text{greater than } 12)$

$100\%$

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.)

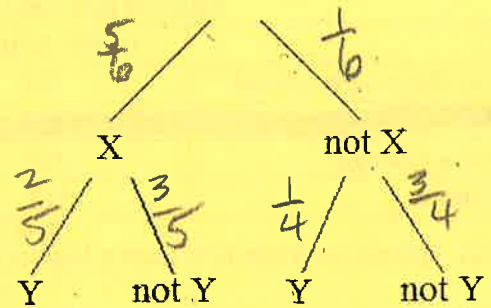
Find these probabilities.

b)  $P(\text{not } X) = \frac{1}{6}$

c)  $P(Y | (\text{not } X)) = \frac{1}{4}$

d)  $P((\text{not } Y) | X) = \frac{3}{5}$

e)  $P(X \text{ and } Y) = \frac{1}{3}$



f)  $P((\text{not } X) \text{ and } (\text{not } Y)) = \frac{1}{8}$

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)  $P(\text{sports} | \text{female})$

$$\frac{39}{334}$$

b)  $P(\text{female} | \text{sports})$

$$\frac{39}{106}$$

c)  $P(\text{reading} | \text{male})$

$$\frac{76}{362}$$

d)  $P(\text{male} | \text{reading})$

$$\frac{76}{161}$$

e)  $P(\text{hiking} | \text{female})$

$$\frac{48}{334}$$

f)  $P(\text{hiking} | \text{male})$

$$\frac{58}{362}$$

g)  $P(\text{male} | \text{shopping})$

$$\frac{68}{139}$$

h)  $P(\text{female} | \text{shopping})$

$$\frac{71}{139}$$

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.

$$(0.55)(.32) = 0.176$$