

Name _____
Mr. Schlansky

Date _____
Algebra

Two Way Frequency Tables

| | | | |
|--------|-------|-------|-------|
| 1. | Tacos | Pizza | Total |
| Male | | | |
| Female | | | |
| Total | | | |

Find all of the joint probabilities in the table.

$P(\text{male} \cap \text{tacos})$ $P(\text{male} \cap \text{pizza})$ $P(\text{female} \cap \text{tacos})$ $P(\text{female} \cap \text{pizza})$

Find all of the marginal probabilities in the table.

$P(\text{male})$ $P(\text{female})$ $P(\text{tacos})$ $P(\text{pizza})$

Find all of the conditional probabilities in the table.

$P(\text{male} / \text{tacos})$ $P(\text{female} / \text{tacos})$ $P(\text{male} / \text{pizza})$ $P(\text{female} / \text{pizza})$

$P(\text{tacos} / \text{male})$ $P(\text{pizza} / \text{male})$ $P(\text{tacos} / \text{female})$ $P(\text{pizza} / \text{female})$

| | | | |
|----------|--------|-----------|-------|
| 2. | Sports | No Sports | Total |
| Music | | | |
| No Music | | | |
| Total | | | |

What is the probability that a student chosen at random:

Plays music and sports

Plays music but not sports

Plays sports but not music

Does not play sports or music

Plays sports

Does not play sports

Plays music

Does not play music

What is the probability that a student who plays music:

Plays sports

Does not play sports

What is the probability that a student who does not play music:

Plays sports

Does not play music

What is the probability that a student who plays sports:

Plays music

Does not play music

What is the probability that a student who does not play sports:

Plays music

Does not play music

One-hundred employees of a company were asked their opinion on paying high salaries to the CEO. Their responses are summarized in the following contingency table.

| | In Favor | Against |
|--------|----------|---------|
| Male | 15 | 45 |
| Female | 4 | 36 |

3. Find each of the joint probabilities.

$P(\text{male and in favor})$ $P(\text{female and in favor})$

$P(\text{male and against})$

$P(\text{female and against})$

4. Find each of the marginal probabilities.

$P(\text{male})$ $P(\text{in favor})$

$P(\text{female})$

$P(\text{against})$

5. Find each of the conditional probabilities:

$P(\text{male/in favor})$ $P(\text{male/against})$

$P(\text{in favor/male})$

$P(\text{against/male})$

$P(\text{female/in favor})$

$P(\text{female/against})$

$P(\text{in favor/female})$

$P(\text{against/female})$

The following table gives the distribution of grades for three professors for a few randomly selected classes that each of them taught during the past few years.

| | Miller | Smith | Moore |
|-----|--------|-------|-------|
| A | 18 | 36 | 20 |
| B | 25 | 44 | 15 |
| C | 85 | 73 | 82 |
| D&F | 17 | 12 | 8 |

Round all decimals to the *nearest thousandth*.

| | |
|---|---|
| 6. What is the joint relative frequency of receiving a B and having Professor Moore? | 7. What is the marginal relative frequency of receiving an A? |
| 8. What is the marginal relative frequency of having Professor Smith? | 9. What is the conditional relative frequency of receiving a C given that the student had Professor Miller? |
| 10. If a student received a D or F, what is the conditional relative frequency that they had Professor Smith? | 11. What percent of Professor Moore's students received a C? |
| 12. With which professor does a student have the best chance of receiving a grade of A? Justify your answer. | |

13. The set of data in the table below shows the results of a survey on the number of messages that people of different ages text on their cell phones each month.

| Age Group | Text Messages per Month | | |
|-----------|-------------------------|-------|---------|
| | 0–10 | 11–50 | Over 50 |
| 15–18 | 4 | 37 | 68 |
| 19–22 | 6 | 25 | 87 |
| 23–60 | 25 | 47 | 157 |

If a person from this survey is selected at random, what is the probability that the person texts over 50 messages per month given that the person is between the ages of 23 and 60?

- 1) $\frac{157}{229}$
- 2) $\frac{157}{312}$
- 3) $\frac{157}{384}$
- 4) $\frac{157}{456}$

14. A statistics class surveyed some students during one lunch period to obtain opinions about television programming preferences. The results of the survey are summarized in the table below.

Programming Preferences

| | Comedy | Drama |
|--------|--------|-------|
| Male | 70 | 35 |
| Female | 48 | 42 |

What percentage of the school's male students would prefer comedy?
Based on the sample, predict how many of the school's 351 males would prefer comedy.
Justify your answer.

15. A public opinion poll was taken to explore the relationship between age and support for a candidate in an election. The results of the poll are summarized in the table below.

| Age | For | Against | No Opinion |
|---------|-----|---------|------------|
| 21-40 | 30 | 12 | 8 |
| 41-60 | 20 | 40 | 15 |
| Over 60 | 25 | 35 | 15 |

What percent of the 21-40 age group was for the candidate?

- 1) 15
- 2) 25
- 3) 40
- 4) 60

16. A radio station did a survey to determine what kind of music to play by taking a sample of middle school, high school, and college students. They were asked which of three different types of music they prefer on the radio: hip-hop, alternative, or classic rock. The results are summarized in the table below.

| | Hip-Hop | Alternative | Classic Rock |
|---------------|---------|-------------|--------------|
| Middle School | 28 | 18 | 4 |
| High School | 22 | 22 | 6 |
| College | 16 | 20 | 14 |

What percentage of college students prefer classic rock?

What percentage of the students that prefer classic rock are college students?