

## Practice Test

### Categorical Data

Questions 1-4 refer to the following information.

	Economics	History	Music
Male	24	20	19
Female	18	22	17

The table above shows the distribution of a group of 120 college students by gender and major.

1

If one student is randomly selected from the group, what is the probability that the student is a History major?

- A)  $\frac{36}{120}$
- B)  $\frac{40}{120}$
- C)  $\frac{42}{120}$
- D)  $\frac{46}{120}$

2

If a male student is selected at random, which of the following is closest to the probability that he is a Music major?

- A) 0.270
- B) 0.302
- C) 0.317
- D) 0.381

3

If one student is randomly selected from the group what is the probability that the student is a male Economics major?

- A)  $\frac{24}{120}$
- B)  $\frac{42}{120}$
- C)  $\frac{24}{42}$
- D)  $\frac{24}{63}$

4

If a Music major is selected at random, which of the following is closest to the probability that the student is a female?

- A) 0.298
- B) 0.315
- C) 0.386
- D) 0.472

Questions 5 and 6 refer to the following information.

	Under 30	30 or older	Total
Male	3		12
Female			20
Total	8	24	32

The incomplete table above shows the distribution of age and gender for 32 people who entered a tennis tournament.

5

If a tennis player is chosen at random, what is the probability that the player will be either a male under age 30 or a female aged 30 or older?

- A)  $\frac{15}{32}$
- B)  $\frac{18}{32}$
- C)  $\frac{20}{32}$
- D)  $\frac{24}{32}$

6

If a person is selected at random from the 30 or older player group, what is the probability that the person is a female?

- A)  $\frac{5}{20}$
- B)  $\frac{15}{20}$
- C)  $\frac{9}{24}$
- D)  $\frac{15}{24}$

Questions 7 and 8 refer to the following information.

Number of Visits to Movie Theaters by Students

	None	1 to 2	3 or more
Juniors	$x$	$2x$	$\frac{1}{2}x$
Seniors	$y$	$\frac{5}{2}y$	$\frac{1}{2}y$

The table above summarizes the number of visits to movie theaters by 168 juniors and 152 seniors during summer vacation.

7

If a student is selected at random from those who visited movie theaters at least once, what is the probability that the student is a junior?

- A)  $\frac{16}{39}$
- B)  $\frac{18}{39}$
- C)  $\frac{20}{39}$
- D)  $\frac{22}{39}$

8

If a student is selected at random, which of the following is closest to the probability that the student is a senior and visited movie theaters 1 or 2 times?

- A) 0.156
- B) 0.205
- C) 0.297
- D) 0.324

## Answers Categorical Data

1. C

	Economics	History	Music
Male	24	20	19
Female	18	22	17

There are 120 student total and 42 students are History majors. Therefore, the probability that the student is a History major is  $\frac{42}{120}$ .

2. B

There are  $24 + 20 + 19 = 63$  male students. If a male student is selected at random, the probability that he is a Music major is  $\frac{19}{63} \approx 0.302$ .

3. A

The probability that the student is a male Economics major is  $\frac{24}{120}$ .

4. D

There are  $19 + 17$ , or 36, Music majors. The probability that a Music major selected at random is a female is  $\frac{17}{36} \approx 0.472$ .

5. B

	Under 30	30 or older	Total
Male	3		12
Female			20
Total	8	24	32

There are 3 males under age of 30. The number of males 30 years or older is  $12 - 3 = 9$ . Therefore, the number of females 30 years or older is  $24 - 9 = 15$ . The probability that the player will be either a male under age 30 or a female aged 30 or older is  $\frac{3+15}{32} = \frac{18}{32}$ .

6. D

There are 15 females who are aged 30 or older. If a person is selected at random from the 30 or older player group, the probability that the person is a female is  $\frac{15}{24}$ .

7. C

Number of Visits to Movie Theaters by Students

	None	1 to 2	3 or more
Juniors	$x$	$2x$	$\frac{1}{2}x$
Seniors	$y$	$\frac{5}{2}y$	$\frac{1}{2}y$

There are 168 juniors and 152 seniors. Therefore,  $x + 2x + \frac{1}{2}x = 168$ , and  $y + \frac{5}{2}y + \frac{1}{2}y = 152$ . Solving the equations give  $x = 48$  and  $y = 38$ .

There are  $2x + \frac{1}{2}x = \frac{5}{2}x = \frac{5}{2}(48) = 120$  juniors and  $\frac{5}{2}y + \frac{1}{2}y = 3y = 3(38) = 114$  seniors who visited movie theaters at least once.

If a student is selected at random from those who visited movie theaters at least once, the probability that the student is a junior is  $\frac{120}{120+114}$ , or  $\frac{20}{39}$ .

8. C

Seniors who visited movie theaters 1 or 2 times is  $\frac{5}{2}y = \frac{5}{2}(38) = 95$ .

The probability that the student is a senior and visited movie theaters 1 or 2 times is

$$\frac{95}{320} \approx 0.297$$