Coordinate Algebra EOC (GSE) Quiz Answer Key

Interpreting Categorical and Quantitative Data - (MGSE9-12.S.ID.5) Summarize Data

Student Name: _____   Date: _____

Teacher Name: THUYNGA DAO   Score: _____

1)

Video Games and Soda

	Drink Soda	Does Not Drink Soda
Play Video Games	13	7
Does Not Play Video Games	6	4

Jordan interviewed her 30 classmates on whether or not they played video games and if they drink soda. She displayed her results in the two-way table shown. Which statement is true?

- A) **A classmate who drinks soda is more likely to play video games.**
- B) A classmate who plays video games is not as likely to drink soda.
- C) About the same percentage of students play video games as those who don't drink soda.
- D) It is twice as likely that a student doesn't play video games nor drink soda as one who plays video games and drinks soda.

Explanation:
Calculate the relative frequency of each possibility:
Play video games and drink soda: 0.433
Play video games and don't drink soda: 0.233
Don't play video games and drink soda: 0.2
Don't play video games and don't drink soda: 0.133

The only choice that is correct is **A classmate who drinks soda is more likely to play video games.**

2)

	Goes to soccer games	Does not go to soccer games
Goes to the movies	0.57	0.18
Do not go to the movies	0.12	0.13

Edward surveyed his friends about whether or not they go to the movies and whether or not they go to professional soccer games. He reported the relative frequencies in the table. Which statement is correct?

- A) Very few of his friends go to professional soccer games.
- B) Very few of his friends go to the movies and go to professional soccer games.
- C) **The majority of his friends go to professional soccer games and go to the movies.**
- D) He has a lot of friends that do not go to the movies and do not go to professional soccer games

Explanation:
The highest relative frequency is 0.57 for those that go to the movies and go to professional soccer games. The lowest relative frequency of 0.12 which is for his friends that do not go the movies but do go to professional soccer games. Therefore the correct statement is **his friends go to professional soccer games and go to the movies**

3)

	Have a Sibling	Only Child
Have Chores	7	9
Do Not Have Chores	8	6

Fiona interviewed her 30 classmates on whether or not they have a sibling and if they have assigned chores at home. She displayed her results in the table shown. Which statement is true?

- A)   More than half of her classmates are only children.
- **B)   Half of her classmates have a sibling, and half do not.**
- C)   More only children do not have chores than those with a sibling.
- D)   Fewer classmates have chores than do have chores.

Explanation:
Half of her classmates have a sibling, and half do not.

Add totals for classmates who have chores and those who do not have chores for each group..
7 + 8 = 15
9 + 6 = 15

4)

Share room and own pets

	Shares a Room	Does not share a room
Has a Cat	6	4
Has a Dog	10	5
Neither Cat nor Dog	5	3

Damien is trying to see if there is a relationship between owning a pet and sharing a room with a sibling. He interviewed his classmates and displayed his results in the two-way table shown. Which statement is true?

- A)   More than half of his classmates have a dog.
- **B)   It is more likely for a classmate who owns pet to share a room.**
- C)   More than 10% of his classmates do not own a pet and don't share a room.
- D)   It is less likely for one of his classmates to have a cat and share a room than have a dog and not share a room.

Explanation:
Calculate the relative frequency of each possibility:
Have a cat and share a room: 0.182
Have a cat and don't share a room: 0.121
Have a dog and share a room: 0.303
Have a dog and don't share a room: 0.152
Don't have a dog or cat and share a room: 0.152
Don't have a dog or cat and don't share a room: 0.090

The only choice that is correct is **It is more likely for a classmate who owns pet to share a room.**

5)

Own a bike and Live near a pool

	Live Near Pool	Does Not Live Near Pool
Owns a Bike	8	7
Does Not Own a Bike	10	5

Gabriel interviewed his 30 classmates on whether or not they own a bike and live near a pool. He displayed his results in the two-way table shown. Which statement is true?

A) If a classmate owns a bike then they live near a pool.

B) If a classmate doesn't own a bike than they don't live near a pool.

C) About $\frac{1}{3}$ of his classmates live near a pool and do not own a bike.

D) A greater percentage of his classmates own a bike and don't live near a pool than own a bike and live near a pool.

Explanation:
Calculate the relative frequency of each possibility:
Live near a pool and own a bike: 0.267
LIve near a pool and don't own a bike: 0.333
Don't live near a pool and own a bike: 0.233
Don't live near a pool and don't ow a bike: 0.167

The only choice that is correct is **About $\frac{1}{3}$ of his classmates live near a pool and don't own a bike.**

6)

	Goes to soccer games	Does not go to soccer games
Goes to the movies	0.57	0.18
Do not go to the movies	0.12	0.13

Edward surveyed his friends about whether or not they go to the movies and whether or not they go to professional soccer games. He reported the relative frequencies in the table.

Which statement the BEST inference he can make?

A) **More of his friends like to go to the movies than to soccer games.**

B) More of his friends like to go to soccer games than to the movies.

C) The fewest number of friends will not go to soccer games.

D) He has more friends who go to soccer games and not the movies than those who go to the movies and not soccer games.

Explanation:
The relative frequency for going to the movies is 0.75 and for going to soccer games is 0.69 so the correct statement is **More of his friends like to go to the movies than soccer games.**

7)

Video Games and Soda

	Drink Soda	Does Not Drink Soda
Play Video Games	13	7
Does Not Play Video Games	6	4

Jordan interviewed her 30 classmates on whether or not they played video games and if they drink soda. She displayed her results in the two-way table shown. Which statement is true?

- A) **About 67% of her classmates play video games.**
- B) More than half of her classmates drink soda and play video games.
- C) There is a greater percentage of students who don't play video games then those who don't drink soda.
- D) The same percentage of students who don't play video games and don't drink soda as those who don't play video games and drink soda.

Explanation:
Calculate the relative frequency of each possibility:
Play video games and drink soda: 0.433
Play video games and don't drink soda: 0.233
Don't play video games and drink soda: 0.2
Don't play video games and don't drink soda: 0.133

The only choice that is correct is **About 67% of her classmates play video games.**

8)

Previous Ownership	Frequency	Relative Frequency
None	85	0.17
Windows	60	0.12
Macintosh	355	0.71
Total	500	1.00

The frequency table represents a survey taken of computer shoppers. What percent of the shoppers were previous owners of either a Windows or Macintosh computer?

- A) 17%
- B) 71%
- C) **83%**
- D) 85%

Explanation:
83%

Add the frequencies for the two categories. Then, multiply by 100 to convert to percent.

.12 + .71 = .83 = 83%

9)

Do you go to the movies at least twice a week?

	Yes	No	Total
Male	35	45	80
Female	67	28	95
Total	102	73	175

Jamie wants to find out how many students at her school go to the movies at least twice a week. She interviews 175 students and records their gender and a *yes* if they go at least twice a week and *no* if they go less than twice a week. She displays the results in the table.

What is the probability that a person who does not go to the movies at least twice a week is female (round to the thousandth)?
- A)   0.160
- B)   0.192
- C)   0.295
- **D)   0.384**

Explanation:
The correct answer is **0.384**. There were 28 females who answered "no," out of a total of 73 people who answered "no." 28/73 ≈ 0.384.

10)

	English	History	Math	Science
9th grade	5	28	32	17
10th grade	24	26	17	10
11th grade	8	15	27	22
12th grade	10	17	28	13

Mario collected data from his classmates on their favorite subject amoung math, science, english and history. The data is displayed in the table.

What is a probability that a randomly selected student will prefer math given they are in 12th grade?
- A)   0.094
- B)   0.227
- C)   0.348
- **D)   0.412**

Explanation:
You are looking for a conditional probability. The probability of a person liking math given they are in 12th grade. The only row that matters is the 12th grade row. There were 68 12th graders surveyed and 28 of them like math so the probability is $\frac{28}{68}$ = **0.412**

11)

Minivan and Two story house

	Lives in a 2 story house	Does not live in a 2 story house
Has minivan	0.65	0.11
Does not have a minivan	0.18	0.06

Jordan surveyed her friends about whether or not they had a minivan and whether or not they lived in a two story house. She reported the relative frequencies in the table shown. Which statement is correct?

    A)   It is least likely that one of her friends lives in a two story house and has a minivan.

    B)   It is most likely that one of her friends has a minivan but does not live in a two story house.

    C)   It is most likely that one of her friends lives in a two story house but does not have a minivan.

    D)   It is least likely that one of her friends does not have a minivan and does not live in a two story house.

Explanation:

The highest relative frequency is 0.65 for those that live in a two story house and have a minivan. The lowest relative frequency of 0.06 is for those that do not have a minivan and do not live in a two story house. Therefore the correct statement is **It is least likely that one of her friends does not have a minivan and does not live in a two story house.**

12) Tim's goal is to run one marathon in each of the 50 states. To determine the order in which he will run the marathons, he will write the name of each state on a slip of paper and place the slips of paper in a bowl. He will then draw the names of the states one at a time from the bowl until all the slips of paper have been drawn.

If there are 26 states east of the Mississippi River and 24 states west of the Mississippi River, what is the probability that the third state drawn will be east of the Mississippi, GIVEN THAT the first one drawn was east of the Mississippi and the second one drawn was west of the Mississippi?

    A) $\dfrac{1}{2}$

    B) $\dfrac{13}{24}$

    C) $\dfrac{13}{25}$

    D) $\dfrac{25}{48}$

Explanation:

The probability that the first state drawn was east of the Mississippi was $\dfrac{26}{50}$, or $\dfrac{13}{25}$. After the first drawing, there were still 24 states west of the Mississippi left, and a total of 49 states left. For this reason, the probability that the second state drawn was west of the Mississippi was $\dfrac{24}{49}$. After the second drawing, there were 25 states east of the Mississippi left and a total of 48 states left. Therefore, the probability that the third state drawn will be east of the Mississippi is $\dfrac{25}{48}$

13)

Blood Type	Male	Female
A	105	93
B	99	84
O	160	140
AB	15	18

A local hospital tracked the blood type and gender of the patients they saw one day. Which statement is a fair statement?

A)   At least 50% of the patients seen on an average day have Blood type O.

B)   The hospital sees about 10% more males than females on an average day.

C)   The hospital sees about 10% more females than males on an average day.

D)   The hospital sees about the same percentage of males as females on an average day.

Explanation:
Calculate the relative frequencies for males, females and blood types. From this you can see that a fair statement is **The hospital sees about 10% more males than females on an average day.**

14)

Two-way frequency tables

Hair Color	Boys	Girls
Black	4	5
Blonde	4	6
Brown	10	8
Red	2	1

The table shows the number of boys and girls that have black, blonde, brown, or red hair color.

What is the probability that a boy has red hair? (round to nearest hundredth)

A)   0.05

B)   0.10

C)   0.11

D)   0.15

Explanation:
0.10

There are 2 red-haired boys, out of 20 boys. $\dfrac{2}{20}$ = 0.10.

15)

Two-way frequency tables

Hair Color	Boys	Girls
Black	4	5
Blonde	4	6
Brown	10	8
Red	2	1

The table shows the number of boys and girls that have black, blonde, brown, or red hair color.

What is the probability that a student has brown hair? (round to nearest hundredth)
- A)   0.42
- **B)   0.45**
- C)   0.58
- D)   0.82

Explanation:
0.45

There are 18 brown-haired students, out of 40 students. $\dfrac{18}{40}$ = 0.45

16)

Two-way frequency tables

Hair Color	Boys	Girls
Black	4	5
Blonde	4	6
Brown	10	8
Red	2	1

The table shows the number of boys and girls that have black, blonde, brown, or red hair color.

What is the probability that a girl has black hair? (round to nearest hundredth)
- A)   0.13
- B)   0.14
- **C)   0.25**
- D)   0.43

Explanation:
0.25

There are 5 black-haired girls, out of 20 girls. $\dfrac{5}{20}$ = 0.25.

17)

New Tax Referendum Poll

	Male	Female
For Referendum	16	30
Against Referendum	19	35

A survey was done to see if people are in favor of or against a new tax referendum. The results separated by gender as well are shown in the table.

If a person was polled at random what is the probability that they are for the tax referendum given they are female?

A)   0.300
B)   0.462
C)   0.538
D)   0.652

Explanation:

This is a conditional probability. The only row that matters is the female one. Therefore the probability is $\frac{30}{65}$ = **0.462**

18)

	Have a Sibling	Only Child
Have Chores	7	9
Do Not Have Chores	8	6

Fiona interviewed her 30 classmates on whether or not they had a sibling and if they have assigned chores at home. She displayed her results in the two-way table shown. Which category had the highest relative frequency?

A)   Sisters
B)   Brothers
C)   Have Chores
D)   Do Not have chores

Explanation:
Calculate the relative frequency for each of the categories.
Brother: 0.358
Sister: 0.410
Only Child: 0.23
No Chores: 0.512
Have Chores: 0.487

The one with the highest relative frequency is **Do not have chores**

19)

Blood Type	Male	Female
A	105	93
B	99	84
O	160	140
AB	15	18

A local hospital tracked the blood type and gender of the patients they saw one day. Which is a fair statement?
   A)   Over half of the patients seen on an average day had blood type O.
   B)   Less than 1% of the patients seen on an average day had blood type AB.
   C)   Double the number of patients seen on an average day had blood type O than blood type B.
   D)   On an average day they will see about the same percentage of patients with types A and B.

Explanation:
The relative frequencies for blood type are: A 0.277, B 0.256, O 0.420 and AB 0.046. Given that the only statement that is correct is
On an average day they will see about the same percentage of patients with blood type A as blood type B.

20)

	English	History	Math	Science
9th grade	5	28	32	17
10th grade	24	26	17	10
11th grade	8	15	27	22
12th grade	10	17	28	13

Mario collected data from his classmates on their favorite subject amoung math, science, english and history. The data is displayed in the table.

Is it likely that a student likes math more if they are in 9th grade or 12th grade? Justify your answer.
   A)   9th grade. 32 9th graders like math while only 28 12th graders like math.
   B)   9th grade. The conditional probability that someone who likes math is in 9th grade is 0.307 while the conditional probability that someone who likes math is in 12 grade is 0.269
   C)   12th grade. The conditional probability that a 12th grader likes math is 0.412, while the conditional probability that a 9th grader likes math is 0.390
   D)   12th grade. As more 12th graders like math than any other subject.

Explanation:
You are looking for two conditional probabilities. The first is that a person likes math given they are in 9th grade and the second is that a person likes math given they are in 12th grade. **12th grade. The conditional probability that a 12th grader likes math is 0.412, while the conditional probability that a 9th grader likes math is 0.390**

21)

Two-way frequency tables

Hair Color	Boys	Girls
Black	4	5
Blonde	4	6
Brown	10	8
Red	2	1

The table shows the number of boys and girls that have black, blonde, brown, or red hair color.

What is the probability that a student has black hair? (round to nearest hundredth)
- **A)** **0.23**
- B) 0.29
- C) 0.46
- D) 0.52

Explanation:
0.23

There are 9 black-haired students, out of 40 students. $\frac{9}{40}$ = 0.23

22)

Two-way frequency tables

Hair Color	Boys	Girls
Black	4	5
Blonde	4	6
Brown	10	8
Red	2	1

The table shows the number of boys and girls that have black, blonde, brown, or red hair color.

What is the probability that a boy has blonde hair? (round to nearest hundredth)
- A) 0.10
- B) 0.15
- **C)** **0.20**
- D) 0.25

Explanation:
0.20

There are 4 blonde-haired boys, out of 20 boys. $\frac{4}{20}$ = 0.20

23)

	Boys	Girls
Zoo	15	8
Museum	10	12

Mr. White collected data from his eighth grade class on whether they prefer the zoo or the museum. Based on the data collected, if the eighth grade has 90 girls and 78 boys, which statement is true?

- A) 31 boys will choose the zoo
- **B) 36 girls will choose the zoo**
- C) 40 girls will choose the zoo
- D) 47 boys will choose the museum

Explanation:
36 girls will choose the zoo

girl likes zoo: $\dfrac{8}{20}$ = 0.40

then,

90 x 0.40 = 36

24)

	French Fries	Onion Rings
Hamburger	62	41
Cheeseburger	56	54
Bacon Cheeseburger	41	40

At Best Burgers, Jack collected sales data on the type of side order served with each type of burger purchased for a week.

Jack serves a half pound of onion rings with every kind of burger.

If Jack sells 120 bacon cheeseburgers total, about how many pounds of onion rings will he serve with them? (round to nearest whole number)

- A) 15 pounds
- B) 18 pounds
- **C) 30 pounds**
- D) 54 pounds

Explanation:
30 pounds

Bacon cheeseburger with onion rings: $\dfrac{40}{(41 + 40)} = \dfrac{40}{81}$ = 0.4938

then,

120 x 0.4938 = 59.256

then,

59.256 x .50 = 29.628

25)

Two-way frequency tables

Hair Color	Boys	Girls
Black	4	5
Blonde	4	6
Brown	10	8
Red	2	1

The table shows the number of boys and girls that have black, blonde, brown, or red hair color.

What is the probability that a student is a boy with red hair? (round to nearest hundredth)
- A) 0.05
- B) 0.10
- C) 0.11
- D) 0.15

Explanation:
0.05

There are 2 red-haired boys, out of 40 students. $\dfrac{2}{40}$ = 0.05.

26)

Two-way frequency tables

Hair Color	Boys	Girls
Black	4	5
Blonde	4	6
Brown	10	8
Red	2	1

The table shows the number of boys and girls that have black, blonde, brown, or red hair color.

What is the probability that a student is a girl with brown hair? (round to nearest hundredth)
- A) 0.20
- B) 0.22
- C) 0.40
- D) 0.44

Explanation:
0.20

There are 8 brown-haired girls, out of 40 students. $\dfrac{8}{40}$ = 0.20.

27)

	Boy	Girl
Dog	27	18
Cat	15	25
Other	10	12

Dr. Mitchell, an animal veterinarian, collected data during animal examinations on the kind of animal a boy or girl has as a pet. Based on the data collected, which statement is true?

   A)   A girl is 17% more likely than a boy to own a cat than a dog or other animal.
   B)   A girl is 45% more likely than a boy to own a cat than a dog or other animal.
   C)   A girl is 29% more likely than a boy to own a cat than a dog or other animal.
   D)   A girl is 67% more likely than a boy to own a cat than a dog or other animal.

Explanation:
A girl is 17% more likely than a boy to own a cat than a dog or other animal.

Girl with cat: $\dfrac{25}{(18 + 25 + 12)} = \dfrac{25}{55} = 0.4545$

Boy with a cat: $\dfrac{15}{(27 + 15 + 10)} = \dfrac{15}{52} = 0.2885$

then,

$0.4545 - 0.2885 = 0.166 \approx 17\%$

28)

Two-way frequency tables

Hair Color	Boys	Girls
Black	4	5
Blonde	4	6
Brown	10	8
Red	2	1

The table shows the number of boys and girls that have black, blonde, brown, or red hair color.

What is the probability that a student is a girl with blonde hair? (round to nearest hundredth)

   A)   0.15
   B)   0.18
   C)   0.25
   D)   0.30

Explanation:
0.15

There are 6 blonde-haired girls, out of 40 students. $\dfrac{6}{40} = 0.15$.

29)

	French Fries	Onion Rings
Hamburger	62	41
Cheeseburger	56	54
Bacon Cheeseburger	41	40

Jack owns a small restaurant called Best Burgers. For one week, he collected sales data on the type of side order served with each type of burger purchased. Jack serves a half pound of french fries with every kind of burger. If Jack sells 180 plain hamburgers how many pounds of french fries will he serve? (round to nearest whole number)

A)   35 pounds
B)   36 pounds
C)   54 pounds
D)   72 pounds

Explanation:
54 pounds

Hamburger with french fries: $\dfrac{62}{(62 + 41)} = \dfrac{62}{103} = 0.6019$

then,

180 x 0.60 = 108

then,

108 x .50 = 54

30)

	Boy	Girl
Dog	27	18
Cat	15	25
Other	10	12

Dr. Mitchell owns a veterinarian clinic. For a week, he collected data during examinations on the kind of animal a boy or girl has as a pet. Based on the data collected, which statement is true?

A)   A boy is 19% more likely than a girl to own a dog than a cat or other animal.

B)   A boy is 33% more likely than a girl to own a dog than a cat or other animal.

C)   A boy is 50% more likely than a girl to own a dog than a cat or other animal.

D)   A boy is 52% more likely than a girl to own a dog than a cat or other animal.

Explanation:

A boy is 19% more likely than a girl to own a dog rather a cat or other animal.

Boy with a dog: $\dfrac{27}{(27 + 15 + 10)} = \dfrac{27}{52} = 0.519$

Girl with dog: $\dfrac{18}{(18 + 25 + 12)} = \dfrac{18}{55} = 0.327$

then,

0.519 - 0.327 = 0.192 ≈ 19%