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Tutor Doctor

Math 7: Data Management and Probability, 10 Questions

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1. Chantelle conducted a survey to determine how students got to her school on a particular day. She found that they had used 4 transportation methods: walking, bike riding, taking the bus, and riding in a car. She interviewed 200 students in all.

Chantelle displayed the results of her survey in a circle graph. The sector of her graph showing how many students walked to school had a central angle of 40° .

How many students walked to school on the day Chantelle surveyed?

- A) 11
- B) 22
- C) 40
- D) 50

Incorrect. Your answer=A, Correct answer=B

Explanation:

A central angle of 40° represents a fraction of the 360° in the entire circle. The fraction of the circle is therefore:

$$\frac{40}{360} = \frac{1}{9}$$

So $\frac{1}{9}$ of the students in the school walked on the day Chantelle conducted her survey. We can change that number to a decimal (or percent):

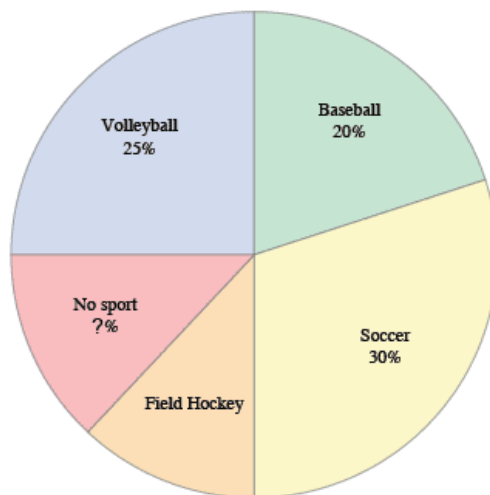
$$\frac{1}{9} = 0.11 = 11\%$$

There are 200 students in all, so 11% of 200 students walked:

$$0.11 \times 200 = 22.22$$

We can't have a fraction of a person, so it's likely that 22 people walked to school on the day of Chantelle's survey.

2.



A student is making a circle graph summarizing which sport each of the Grade 7 students at her school prefer to play. She isn't quite done, but the graph above shows what she has finished so far.

If there are 50 students in grade 7, and 4 of them like to play Field Hockey best, what percent of the students prefer to play no sport?

- A) 8
- B) 10
- C) 17
- D) 83

Incorrect. Your answer=A, Correct answer=C

Explanation:

We can solve this problem in two steps:

Firstly, there are 4 students out of 50 who prefer field hockey:

$$\frac{4}{50} = \frac{8}{100} = 0.08 = 8\%$$

So, the field hockey section is 8% of the whole.

Adding the other percentages given in the table we get (starting with volleyball and going around counterclockwise):

$$8\% + 25\% + 20\% + 30\% = 83\%$$

The entire circle graph should add up to 100%, so the percentage of students who prefer to play no sport would be:

$$100\% - 83\% = 17\%$$

3.

Mr. Ferguson organizes the school ski club. He has a list of 55 students who have paid to go skiing tonight. 25 of the students are in grade 9, 18 are in grade 8, and 12 are in grade 7.



The probability that the first student on the bus to the ski hill will be in grade 8, and the first student on the bus back home will also be in grade 8, is

- A) 0.03
- B) 0.04
- C) 0.11
- D) 0.33

Incorrect. Your answer=A, Correct answer=C

Explanation:

The events are independent, so we can multiply the probabilities together. The probability of a grade 8 student being first on the bus to the ski hill is $\frac{18}{55}$. The probability of a grade 8 student being first on the bus back home is $\frac{18}{55}$. Therefore, the probability of both events is $\frac{18}{55} \times \frac{18}{55} = \frac{324}{3025}$ or 0.11.

4.

Jill was analyzing flower production in a test area of a greenhouse. The number of flowers each plant produced was recorded. The mean was found to be 14, and the median was 10.

If the plants were given fertilizer and each plant produced an additional 4 flowers, what would be the new mean and median?

- A) Mean = 56; median = 40
- B) Mean = 10; median = 6

C) Mean = 18; median = 14

D) You need more data to calculate the new mean and median

Incorrect. Your answer=A, Correct answer=C

Explanation:

The median and mean will both rise by 4, so the answer is C.

Here is a brief explanation:

Suppose that there were just 5 plants, and here were the original number of flowers on each plant:

{3, 7, 10, 20, 30}

The median is 10 (the middle score)

Now, add 4 to each score...

{7, 11, 14, 24, 34}

The new median is 14. We've added 4 to EACH number, so no matter how many plants there are, the new median will simply be 4 larger.

We can do the same thing with the mean using the same made up set of data:

{3, 7, 10, 20, 30}

The sum of the number of flowers is 70, so the mean is:

$$\frac{70}{5} = 14$$

When we add 4 to each score....

{7, 11, 14, 24, 34}

...the sum of the scores is 90 and the mean is:

$$\frac{90}{5} = 18$$

Adding 4 to each score raises the mean by 4, so the answer is C.

5.



Using a standard deck of cards (without jokers), a card is chosen at random, replaced, and then a second card is chosen at random.

The probability of drawing a JACK and then a FACE CARD can be represented as the reduced fraction A/B.

A + B = _____

Incorrect. Your answer=22/23, Correct answer=172

Explanation:

There are four Jacks in a set of playing cards.

The probability of drawing a Jack from a standard deck of 52 cards is, therefore, $\frac{4}{52}$, which is equivalent to $\frac{1}{13}$

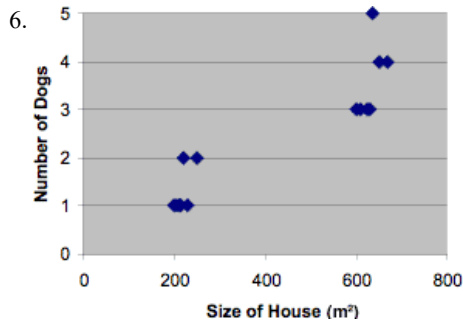
There are 12 face cards in a set of playing cards.

The probability of drawing a Face Card from a standard deck of 52 cards is, therefore, $\frac{12}{52}$, which is equivalent to $\frac{3}{13}$

So, the probability of drawing a Jack, replacing the card and then drawing a Face Card is $\frac{1}{13} \times \frac{3}{13} = \frac{3}{169}$

This is in the form A/B, where A = 3 and B = 169

So, to answer the question $A + B = 3 + 169 = 172$



Based on the graph above, which of the following is true?

- A) The data is clustered around two points
- B) There is a gap in the data for houses 300 - 500 m²
- C) The data shows a definite trend
- D) All of the above

Incorrect. Your answer=A, Correct answer=D

7.

You bought five raffle tickets for a brand new mountain bike. One thousand tickets were sold in total. You also bought 10 raffle tickets for a dirt bike. Two thousand of those tickets were sold.

What are the chances that you will win both bikes?

- A) $\frac{1}{40000}$
- B) $\frac{15}{4000}$
- C) $\frac{1}{2000}$
- D) $\frac{50}{4000}$

Correct. Your answer=A, Correct answer=A

Explanation:

The events are independent, so we can multiply the probabilities together. The probability of winning the mountain bike is $\frac{5}{1000}$, the probability of winning the dirt bike is $\frac{10}{2000}$. Therefore the probability of winning both is $\frac{5}{1000} \times \frac{10}{2000} = \frac{1}{40000}$

8.

The data set below shows the age of children attending a library storytime:

{1, 1, 2, 2, 2, 3, 3, 3, 4, 5, 6, 7, 7, 7, 9, 9, 10}

What is the range of ages for the children attending the storytime?

- A) 4.76 years
- B) 9 years
- C) 1 year
- D) 4 years

Incorrect. Your answer=A, Correct answer=B

Explanation:

The range is the difference between the highest and lowest values....

So $10 - 1 = 9$

9. Given the following set of numbers: {2, 5, 3, 21, 4, 6, 2}, which number other than 2, in the data set, would you need to determine the range?

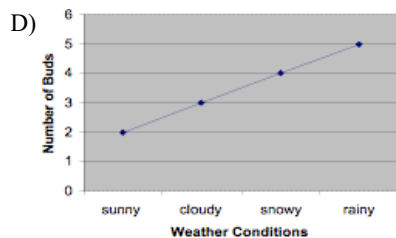
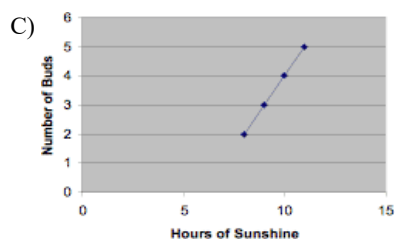
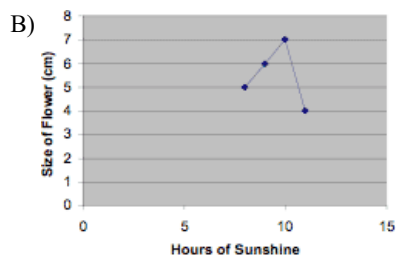
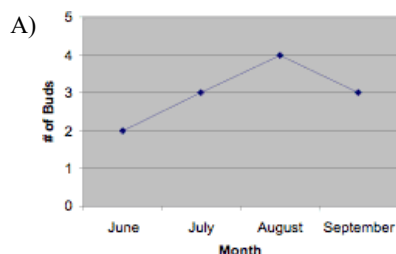
- A) 2
- B) 3
- C) 6
- D) 21

Incorrect. Your answer=A, Correct answer=D

Explanation:

Range is a measure of how far the data spreads and is determined by subtracting the smallest value in a set from the largest. In this case, 2 is the smallest value and 21 is the largest.

10. Alistair is looking for data for his research project which is attempting to see if there is a relationship between the number of buds a sunflower gets and the amount of sunlight it receives daily. Which of the graphs shown below would give Alistair the BEST data for his project?



Incorrect. Your answer=A, Correct answer=C

Explanation:

A line graph shows how something changes over the course of time.

Choice B doesn't reflect the information Alistair is interested in, so this would not be the correct choice.

Choice D would not be appropriate for a line graph, so it isn't the correct choice.

Answer A is conceivable, since there is an accumulation of sunlight over the summer that could result in more buds in August. This graph does track number of buds in relation to time.

However, Choice C is the BEST option as it clearly indicates the effect of hours of sunshine on the number of buds. This is exactly what Alistair is studying.

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