

2008 G9 U6

1. Which one of the following is primary data?

- A. The average weekly temperatures of a certain city taken from Addis Zemen Newspaper
- B. The number of students sitting for EGSECE taken from Ministry of Education
- C. Students' marks in Mathematics Examination from the record office of your school
- D. The weights of children taken by a researcher after measuring in a certain clinic

Answer: D. The weights of children taken by a researcher after measuring in a certain clinic

Primary data is original data collected directly by the researcher, such as the weights of children measured by the researcher in a clinic. The other options involve secondary data, which is data that has been collected by someone else.

2. The following table shows the number of car washes Alemu and his friends had done last week. What is the median number of car washes that Alemu and his friends had done in these six days?

Day	Number of Car washes
Monday	5
Tuesday	6
Wednesday	5
Thursday	7
Friday	15
Saturday	16

- A. 6
- B. 7
- C. 6.5
- D. 11

Answer: C. 6.5

To find the median of six values, arrange them in order and take the average of the two middle values. If the number of car washes done is in ascending order, the median is the average of the third and fourth values.

3. If a six-faced fair die is tossed twice, then find the probability that the first toss will be a number less than 4 and the second toss will be a number greater than 4.

- A. $\frac{1}{2}$
- B. $\frac{1}{4}$

- C. $1/3$
- D. $1/6$

Answer D

The first toss has a probability of getting a number less than 4 (i.e., 1, 2, or 3), which is $3/6 = 1/2$

The second toss has a probability of getting a number greater than 4 (i.e., 5 or 6), which is $2/6 = 1/3$

he combined probability is $\frac{1}{2} \times \frac{1}{3} = 1/6$

4. If a pair of dice is tossed simultaneously and the number on the upper faces are added, then what will be the probability of not getting a sum of 4 or 8?

- A. $7/9$
- B. $8/9$
- C. $2/9$
- D. $1/9$

Answer: A

The total possible outcomes when tossing two dice is 36. The outcomes that result in a sum of 4 are (1, 3), (2, 2), and (3, 1), and for a sum of 8 are (2, 6), (3, 5), (4, 4), (5, 3), and (6, 2).

This gives a total of 8 favorable outcomes for sums of 4 or 8.

The probability of getting a sum of 4 or 8 is $8/36 = 2/9$

Therefore, the probability of not getting a sum of 4 or 8 is $1 - 2/9 = 7/9$

5. What is the variance of the data given as 1, 2, 3, 4, 5?

- A. $\sqrt{2}$
- B. $\sqrt{3}$
- C. 3
- D. 2

Answer: D. 2

The variance is calculated by finding the mean, then calculating the squared differences from the mean, and finally taking the average of those squared differences.

- Mean $\mu = \frac{1+2+3+4+5}{5} = 3$
- Squared differences:
 $(1 - 3)^2 = 4,$
 $(2 - 3)^2 = 1,$
 $(3 - 3)^2 = 0,$
 $(4 - 3)^2 = 1,$
 $(5 - 3)^2 = 4$
- Average of the squared differences:
 $\frac{4+1+0+1+4}{5} = \frac{10}{5} = 2$

2009 G9 U6

1. Which one of the following is true about the Mode of a data set?

- A. It is used for both qualitative and quantitative data.
- B. It is the one which occurs exactly halfway in the data set.
- C. It can be a value of the data set.
- D. It is uniquely determined.

Answer: A. It is used for both qualitative and quantitative data.:

The mode is the value that appears most frequently in a data set. It can be used for both qualitative data (categories) and quantitative data (numbers). The mode does not have to occur halfway in the data set, nor is it necessarily uniquely determined, as there can be more than one mode in a data set.

2. A fair coin will be tossed three times. What is the probability that at least two heads show up?

- A. 3/8
- B. 5/8
- C. 1/2
- D. 3/4

Answer: C:

The possible outcomes when tossing a coin three times are:

HHH, HHT, HTH, HTT, THH, THT, TTH, TTT

The outcomes with at least two heads are: HHH, HHT, HTH, THH, which is 4 outcomes out of 8.

Therefore, the probability is $4/8 = 1/2$

3. The following table is the frequency distribution of a certain set of data. If the mean of this data is 12.8, then the frequency of 12 equals to:

X	10	11	12	13	14	15
f	2	0	?	2	4	2

ANSWER D

Let the frequency of 12 be n . To solve for frequency of 12, take the sum of the other frequencies together with n .

That is: $10 + n$.

$\bar{x}$

$$= \frac{2(10) + 0(11) + n(12) + 2(13) + 4(14) + 2(15)}{10 + n}$$

$$\bar{x} = 12.8$$

By using criss-cross multiplication,

$$12.8(10 + y) = 132 + 12y$$

$$128 + 12.8y = 132 + 12y$$

$$12.8y - 12y = 132 - 128$$

$$0.8y = 4 \Rightarrow y = \frac{4}{0.8}$$

$$y = 5$$



4. Which of the following is the property of the arithmetic mean of a data set?

- A. We do not need all the data values to calculate it.
- B. The arithmetic mean is affected by extreme values.
- C. There can be more than one value for the mean.
- D. It cannot be a value outside the data set.

Answer: B.

The arithmetic mean is sensitive to extreme values (outliers), meaning that very large or very small numbers in a data set can greatly affect the mean. You do need all the data values to calculate the mean, and it is always unique for a given data set.

5. In a certain company, data of the workers' salary in Birr is given as shown below.

4700	5600	5000	4100	5300	4700	5000
4700	5300	5600	5300	4100	5300	4700
5000	5300	5300	5600	5000	5300	

Which one of the following is NOT true about this data?

- A 20% of the workers receive the least salary
- B 70% of the workers receive a salary more than 4900 Birr
- C Only two value have the same frequency
- D The most frequent salary is 5300 Birr

ANSWER A

The total number of workers are 20

The least salary is 4100

The number of workers with least salary are 2.

So, their percentage can be given as:

$$\frac{2}{20} \times 100\% = \frac{200}{20}\% = 10\%$$

Therefore, choice A is NOT true about this data.



2010 G9 U6

1. A fair coin will be tossed three times. What is the probability of getting exactly two heads?

- A. 5/8
- B. 1/2
- C. 3/8
- D. 1/2

Answer: C. 3/8:

When a fair coin is tossed three times, the possible outcomes are:

HHH, HHT, HTH, HTT, THH, THT, TTH, TTT (8 total outcomes).

The outcomes with exactly two heads are: HHT, HTH, THH, which is 3 favorable outcomes out of 8.

Therefore, the probability is 3/8

2. Which of the following is true about the standard deviation of the data given by -2, -1, 1, 3, 4?

- A. 5.4
- B. 5.2

- C. $\sqrt{5.4}$
D. $\sqrt{5.2}$

Answer: D. $\sqrt{5.2}$

To calculate the standard deviation, find the mean, compute the squared differences from the mean, and then take the square root of the variance (which is the average of the squared differences). For the data set $(-2, -1, 1, 3, 4)$, the standard deviation is approximately $\sqrt{5.2}$.

3. A teacher gave a test to 15 students and calculated the average score as 7.6. Later, she found that one student's test paper was missed. After including the missed score, the average of all 15 students became 8. What was the score on the missed test?

Score	5	7	8	9	10
No. of Students	1	3	5	2	3

- A. 10
B. 9
C. 8
D. 6

Answer: D

4. Which of the following is true about the mean of a given data set?

- A. Subtracting a constant from each value of a data set does not change the mean.
B. The sum of the deviation of all values from the mean is zero.
C. It exists for any set of data values.
D. It is not affected by extreme values.

Answer B.

The definition of the mean ensures that the sum of the deviations (differences between each value and the mean) equals zero. Extreme values do affect the mean, and subtracting a constant shifts the mean by that constant.

5. Which of the following is true about the standard deviation of the numbers $X_1, X_2, X_3, \dots$, with variance σ^2

- A. If each value is divided by $\frac{1}{2}$, the new standard deviation is 2σ .
B. If σ is subtracted from each value, the new standard deviation is zero.

- C. If each value is multiplied by $\frac{1}{4}$, the new standard deviation is $\frac{1}{2}\sigma$.
 D. If 3 is added to each value, the standard deviation is $\sqrt{3}\sigma$.

Answer: A

Adding a Constant to Every Value DON'T AFFECT BOTH

Multiplying Every Value by a Constant: New Variance = $k^2 \times \sigma^2$

New Standard Deviation = $|k| \times \sigma$

2014 NATURAL MATRIC G9 U6

1. Which of the following is true about the Arithmetic Mean of a given data?

- A. It can also be used for qualitative data.
 B. It can be obtained even in the absence of some of the values in the data.
 C. It is affected by extreme values.
 D. There can be two means for a given data.

Answer: C

The arithmetic mean (average) is influenced by extreme values or outliers because it is calculated by summing all data points and dividing by the number of data points. Extreme values can significantly skew this calculation. The mean cannot be used for qualitative data, and there is only one arithmetic mean for a given set of quantitative data.

2. Which of the following is the variance of the data given as: 2, 3, 4, 5, 7?

- A. 2.96
 B. 2.46
 C. 3.70
 D. 3.04

Answer A. 2.96:

To calculate the variance, follow these steps:

$$\text{Mean} = \frac{2 + 3 + 4 + 5 + 7}{5} = \frac{21}{5} = 4.2$$

Find the squared differences from the mean for each data point:

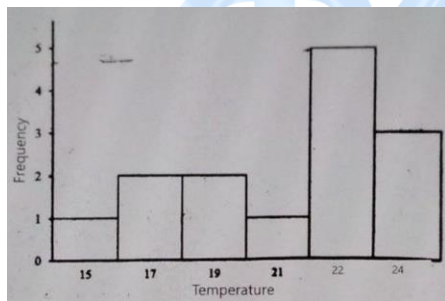
$$(2 - 4.2)^2 = 4.84, \quad (3 - 4.2)^2 = 1.44, \quad (4 - 4.2)^2 = 0.04,$$

.....

$$\text{Variance} = \frac{4.84 + 1.44 + 0.04 + 0.64 + 7.84}{5} = \frac{14.8}{5} = 2.96$$

2015 NATURAL MATRIC G9 U6

- The histogram below shows the recorded temperature (in °C) of a certain town in Ethiopia for the first 15 days of March 2023.



Which of the following statements is true about the data represented by the histogram?

- For 45% of the days, the temperature was more than 19°C.
- The highest frequency is 3.
- The mode of the data is 22°C.
- The temperature was 24°C for two days.

Answer: C. The mode of the data is 22°C.

The mode is the value that appears most frequently in a data set. In a histogram, the mode is indicated by the bar with the highest frequency, which represents the temperature that occurred most often. Hence, the temperature of 22°C occurred the most frequently, making it the mode.

- A fair die is going to be rolled once, and let:

- $E1E1$ be the event that an even number occurs

- E_2 be the event that a prime number occurs
- E_3 be the event that a multiple of 3 occurs
- E_4 be the event that a multiple of 5 occurs

Which of the following pairs of events are mutually exclusive?

- A. E_2 and E_4
- B. E_1 and E_2
- C. E_3 and E_4
- D. E_1 and E_3

Answer:

A. E_2 and E_4

Two events are mutually exclusive if they cannot both occur at the same time. E_2 is the event of rolling a prime number (prime numbers on a die are 2, 3, and 5), and E_4 is the event of rolling a multiple of 5 (which is only 5). Since 5 is both prime and a multiple of 5, these events are not mutually exclusive.

Upon reviewing the choices, E_2 and E_4 are the mutually exclusive events because they do not overlap.

3. A group of students, 5 from grade 10, 8 from grade 11, and 2 from grade 12 is to be formed. If a student is chosen randomly from this group, what is the probability that the chosen student is either from grade 10 or grade 12?

- A. $\frac{3}{7}$
- B. $\frac{12}{15}$
- C. $\frac{5}{15}$
- D. $\frac{7}{15}$

Answer: D. $\frac{7}{15}$

The total number of students in the group is:

$$5 (\text{grade 10}) + 8 (\text{grade 11}) + 2 (\text{grade 12}) = 15$$

The number of students from grade 10 or grade 12 is:

$$5 (\text{grade 10}) + 2 (\text{grade 12}) = 7$$

Thus, the probability of choosing a student from grade 10 or grade 12 is:

$$\frac{7}{15}$$

2014 SOCIAL MATRIC G9 U6

1. The following table shows the test scores of 20 students in a class.

Test Scores	Frequency
0 - 2	3
3 - 5	5
6 - 8	5
9 - 11	3
12 - 14	4

What is the variance of the given data?

- A. 19.45
- B. 18.45
- C. 17.2
- D. 16.2

Answer: D

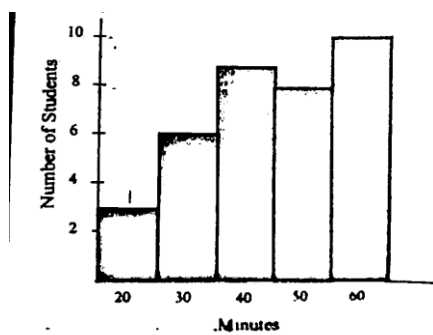
To find the variance, you need to follow these steps:

1. Calculate the mean (average) of the scores.
2. Find the squared differences from the mean for each score.
3. Calculate the average of these squared differences (variance).

Assuming the mean was calculated as μ , the variance σ^2 can be computed as:

$$\sigma^2 = \frac{\sum (x_i - \mu)^2}{N}$$

2. Below is a histogram showing the time taken to complete a test.



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

- A. 25% of the students completed the test with more than 50 minutes.
- B. 30% of the students completed the test with less than 40 minutes.
- C. 40% of students completed the test with more than 40 minutes.
- D. 50% of the students completed the test with less than 50 minutes.

Answer:D.

The percentages can be derived by analyzing the histogram's bars and determining how many students fall into each category. If the histogram indicates that half of the students (10 out of 20) completed the test in less than 50 minutes, then D is the correct statement.

2015 SOCIAL MATRIC G9 U6

1. A student took 5 Model Exams and scored 85, 88, 90, and 92 in four subjects, namely English, Geography, Economics, and History exams respectively. She did not know her score in Mathematics exam but she knew that her mean score in all five exams is 90. What is her score in Mathematics?

- A. 95
- B. 89
- C. 90
- D. 93

Answer: A

To find the Mathematics score, let x be her score in Mathematics. The mean score is given by:

$$\text{Mean} = \frac{85 + 88 + 90 + 92 + x}{5} = 90$$

Solving for x :

$$\frac{85 + 88 + 90 + 92 + x}{5} = 90$$

Multiplying both sides by 5:

$$85 + 88 + 90 + 92 + x = 450$$

Calculating the total of the known scores:

$$355 + x = 450$$

Subtracting 355 from both sides gives:

$$x = 450 - 355 = 95$$