Foundations of Mathematics and Statistics

Mathematics · Answer Key · 20 Questions

1. Which set of numbers includes all positive whole numbers, zero, and all negative whole numbers?

A) Natural Numbers
B) Whole Numbers
C) Integers
D) Rational Numbers

2. What is the result of applying the Distributive Property to a(b + c)?

A) ab + ac
B) a + b + c
C) ab + c
D) a(bc)

3. According to PEMDAS, which operation should be performed first?

A) Multiplication
B) Addition
C) Exponents
D) Parentheses

4. What is the rule for a number to be divisible by 9?

A) The last digit is even
B) The sum of digits is a multiple of 9
C) The last two digits are divisible by 9
D) The number ends in 0 or 9

5. What is the relationship between GCF, LCM, and the product of two numbers a and b?

A) GCF + LCM = a + b
B) GCF / LCM = a / b
C) GCF * LCM = a * b
D) GCF - LCM = a - b

6. What is the formula for calculating the Part given a Percent and a Whole?

A) Part = Percent / Whole
B) Part = Percent * Whole
C) Part = Whole / Percent
D) Part = Percent + Whole

7. In an inverse proportion, what happens if one value increases?

A) The second value increases
B) The second value stays the same
C) The second value decreases
D) The second value becomes zero

8. What is the result of x^a * x^b?

A) x^(a+b)
B) x^(a-b)
C) x^(ab)
D) (x^a)^b

9. What is the value of any non-zero number raised to the power of zero?

A) 0
B) 1
C) x
D) Undefined

10. A negative exponent x^-a is equivalent to which of the following?

A) -x^a
B) 1 / x^a
C) x / a
D) a / x

11. What is the difference between a population parameter and a sample statistic?

A) Parameters describe samples, statistics describe populations
B) Parameters are larger, statistics are smaller
C) Parameters summarize populations, statistics summarize samples
D) There is no difference

12. Which type of data is defined by numerical measurements like height or weight?

A) Qualitative
B) Categorical
C) Discrete
D) Continuous

13. Which level of measurement has a true absolute zero point?

A) Nominal
B) Ordinal
C) Interval
D) Ratio

14. How do you calculate the mean of a dataset?

A) Sum of values divided by count
B) Middle value of the set
C) Most frequent value
D) Range of values

15. When a dataset has an even number of values, how is the median calculated?

A) Take the first value
B) Take the last value
C) Average the two middle values
D) Sum all values

16. What does the mode of a dataset represent?

A) The average value
B) The middle value
C) The most frequent value
D) The spread of values

17. What is the range of a dataset?

A) Mean minus median
B) Maximum minus minimum
C) Standard deviation squared
D) Sum of all values

18. Why is 'n-1' used in the sample variance formula?

A) To make the number smaller
B) To account for sample estimation bias
C) To simplify the math
D) To calculate the median

19. What is the relationship between standard deviation and variance?

A) SD is the square of variance
B) SD is the square root of variance
C) SD is the variance divided by n
D) SD is the same as variance

20. What percentage of data falls at or below the first quartile (Q1)?

A) 25%
B) 50%
C) 75%
D) 100%