GLOBAL INNOVATOR OLYMPIAD

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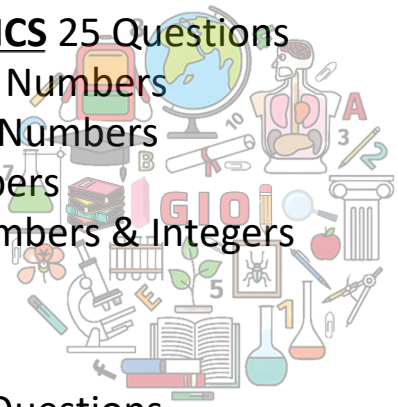

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1.English

1.1 Noun

A noun is a word that represents a person, place, thing, or idea. Nouns can be classified into various categories: common nouns, proper nouns, collective nouns, abstract nouns, and concrete nouns.

Examples:

1. Common Noun: *dog*, *city*, *book*
2. Proper Noun: *John*, *Paris*, *Harry Potter*
3. Collective Noun: *team*, *flock*, *bunch*
4. Abstract Noun: *happiness*, *freedom*, *beauty*
5. Concrete Noun: *apple*, *car*, *table*

Questions:

1. Identify the common noun in the following sentence: “The dog barked loudly.”
2. Write a sentence using a proper noun.
3. List three collective nouns you can think of.
4. Provide examples of abstract and concrete nouns.

1.2 Pronoun

A pronoun is a word that takes the place of a noun. Pronouns help avoid repetition and make sentences clearer. There are several types of pronouns, including personal pronouns, possessive pronouns, and demonstrative pronouns.

Examples:

1. Personal Pronoun: *he*, *she*, *they*
2. Possessive Pronoun: *his*, *her*, *their*
3. Demonstrative Pronoun: *this*, *that*, *these*, *those*

Questions:

1. Replace the noun in the following sentence with a pronoun: “Sara loves her cat.”
2. Identify the possessive pronoun in this sentence: “This is my book.”
3. Write a sentence using a demonstrative pronoun.

1.3 Sentences

A sentence is a group of words that expresses a complete thought. It must contain a subject and a predicate. Sentences can be classified as declarative, interrogative, imperative, or exclamatory.

Examples:

1. Declarative: “The sun rises in the east.”
2. Interrogative: “Where are you going?”
3. Imperative: “Please close the door.”
4. Exclamatory: “What a beautiful day!”

Questions:

1. Write a declarative sentence about your favorite hobby.
2. Formulate an interrogative sentence using the word “what.”
3. Create an imperative sentence asking someone to help you.

1.4 Verb

A verb is a word that expresses an action or a state of being. Verbs are essential components of sentences. They can be classified as action verbs, linking verbs, and helping verbs.

Examples:

1. Action Verb: *run*, *jump*, *write*
2. Linking Verb: *is*, *are*, *was*
3. Helping Verb: *has*, *will*, *can*

Questions:

1. Identify the verb in the following sentence: “She is running fast.”
2. Write a sentence using an action verb.
3. Provide an example of a linking verb in a sentence.

1.5 Conjunction

A conjunction is a word that connects words, phrases, or clauses. Conjunctions are essential for forming complex sentences. The main types of conjunctions are coordinating, subordinating, and correlative conjunctions.

Examples:

1. Coordinating: *and*, *but*, *or*
2. Subordinating: *because*, *although*, *if*
3. Correlative: *both...and*, *either...or*, *neither...nor*

Questions:

1. Identify the conjunction in the following sentence: “I want to go to the park, but it is raining.”
2. Write a sentence using a subordinating conjunction.
3. Create a sentence with a correlative conjunction.

1.6 Preposition

A preposition is a word that shows the relationship between a noun or pronoun and other words in a sentence. Prepositions often indicate location, time, or direction.

Examples:

1. Location: *in*, *on*, *at*
2. Time: *before*, *after*, *during*
3. Direction: *to*, *from*, *toward*

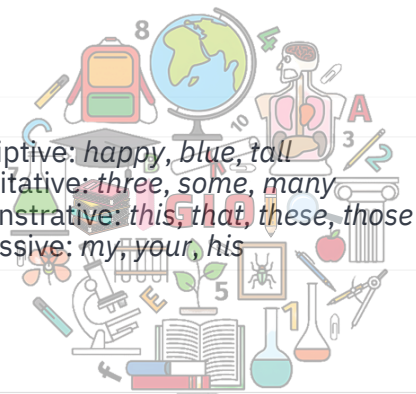
Questions:

1. Identify the preposition in the following sentence: “The cat is under the table.”
2. Write a sentence using a preposition indicating time.
3. Create a sentence with a direction preposition.

1.7 Adjective

An adjective is a word that describes or modifies a noun or pronoun. Adjectives add detail and clarity to sentences. They can be classified as descriptive, quantitative, demonstrative, and possessive adjectives.

Examples:



1. Descriptive: *happy*, *blue*, *tall*
2. Quantitative: *three*, *some*, *many*
3. Demonstrative: *this*, *that*, *these*, *those*
4. Possessive: *my*, *your*, *his*

Questions:

1. Identify the adjective in the following sentence: “The tall building is impressive.”
2. Write a sentence using a demonstrative adjective.
3. Provide an example of a quantitative adjective in a sentence.

1.8 Adverb

An adverb is a word that modifies a verb, adjective, or other adverb. Adverbs often answer questions such as how, when, where, and to what extent. They can be classified as adverbs of manner, time, place, frequency, and degree.

Examples:

1. Adverb of Manner: *quickly*, *carefully*, *loudly*
2. Adverb of Time: *now*, *later*, *yesterday*
3. Adverb of Place: *here*, *there*, *everywhere*
4. Adverb of Frequency: *always*, *often*, *rarely*
5. Adverb of Degree: *very*, *quite*, *too*

Questions:

1. Identify the adverb in the following sentence: “She sings beautifully.”
2. Write a sentence using an adverb of time.
3. Create a sentence with an adverb of place.

1.9 Determiners

A determiner is a word that introduces a noun and specifies it as known or unknown. Determiners can indicate quantity, possession, or definiteness. They include articles, demonstratives, possessives, and quantifiers.

Examples:

1. Articles: *a*, *an*, *the*
2. Demonstratives: *this*, *that*, *these*, *those*
3. Possessives: *my*, *your*, *his*
4. Quantifiers: *some*, *many*, *few*

Questions:

1. Identify the determiner in the following sentence: “I saw a dog in the park.”
2. Write a sentence using a demonstrative determiner.
3. Provide examples of possessive determiners in sentences.

2.Mathematics

1.1 Knowing Our Numbers

In mathematics, numbers are used to represent quantities. We classify numbers into different types, such as natural numbers, whole numbers, integers, rational numbers, and irrational numbers. Each type of number has its own properties and applications.

Types of Numbers:

1. **Natural Numbers:** The counting numbers starting from 1 (1, 2, 3, 4, 5, ...). They are used for counting and ordering.
2. **Whole Numbers:** Natural numbers including zero (0, 1, 2, 3, 4, 5, ...). They are used in situations where zero is a valid count.
3. **Integers:** All whole numbers, including negative numbers (..., -3, -2, -1, 0, 1, 2, 3, ...). Integers are used in various mathematical operations.
4. **Rational Numbers:** Numbers that can be expressed as a fraction (e.g., 1/2, 3/4). They include integers and whole numbers.
5. **Irrational Numbers:** Numbers that cannot be expressed as a simple fraction (e.g., √2, π). They have non-repeating, non-terminating decimal expansions.

Examples:

- **Natural Numbers:** 1, 2, 3, 4, 5, ...
- **Whole Numbers:** 0, 1, 2, 3, 4, 5, ...
- **Integers:** ..., -3, -2, -1, 0, 1, 2, 3, ...
- **Rational Numbers:** 1/2, 3/4, -5/8
- **Irrational Numbers:** √2 (approximately 1.414), π (approximately 3.142)

Questions:

1. Identify whether the following numbers are natural numbers, whole numbers, or integers: -1, 0, 5, 10.
2. Write three examples of rational numbers.
3. What are irrational numbers? Provide two examples.
4. List the first five natural numbers.

1.2 Playing with Numbers

Playing with numbers involves various operations like addition, subtraction, multiplication, and division. Understanding these operations is fundamental in solving mathematical problems. Mastery of these basic operations is essential for success in more complex mathematics.

Operations:

1. **Addition:** The process of combining two or more quantities.
   - Example: 5 + 3 = 8
2. **Subtraction:** The process of taking one quantity away from another.

- Example: 10 - 4 = 6

3. **Multiplication:** The process of repeated addition of the same number.
   - Example: 7 × 2 = 14
4. **Division:** The process of determining how many times one number is contained within another.
   - Example: 20 ÷ 4 = 5

Questions:

1. Calculate the sum of 25 and 47.
2. What is the result of subtracting 15 from 50?
3. Multiply 6 by 9.
4. Divide 81 by 9.

1.3 Whole Numbers

Whole numbers include all natural numbers and zero. They do not include any negative numbers or fractions. Whole numbers are used in various real-world applications, such as counting items or measuring quantities.

Characteristics:

- Whole numbers are closed under addition and multiplication.
- The smallest whole number is 0.
- Whole numbers can be used in everyday situations, such as counting objects.

Examples:

- Whole numbers: 0, 1, 2, 3, 4, ...
- The sum of two whole numbers: 3 + 5 = 8
- The product of two whole numbers: 4 × 7 = 28

Questions:

1. List the first ten whole numbers.
2. What is the product of 0 and any whole number?
3. If you add 2 to the whole number 5, what do you get?
4. Are negative numbers included in whole numbers? Explain.

1.4 Negative Numbers & Integers

Negative numbers are numbers less than zero. Integers include both positive and negative whole numbers, as well as zero. Understanding negative numbers is crucial in various real-life contexts, such as temperature and debt.

Properties:

- Integers can be added, subtracted, multiplied, and divided.

- The result of adding a negative number to a positive number can lead to a negative outcome.
- Understanding the placement of negative numbers on a number line helps visualize their values.

Examples:

- Integers: -3, -2, -1, 0, 1, 2, 3
- A negative number: -5
- The sum of a positive and a negative integer: 4 + (-3) = 1

Questions:

1. What is the smallest integer?
2. List five negative integers.
3. What is the result of -7 + 5?
4. How many integers are there between -3 and 2?

1.5 Fractions

A fraction represents a part of a whole. It consists of a numerator (the top number) and a denominator (the bottom number). Fractions are essential in various applications, including cooking, measurement, and dividing resources.

Types of Fractions:

1. **Proper Fractions:** The numerator is less than the denominator (e.g., 3/4).
2. **Improper Fractions:** The numerator is greater than or equal to the denominator (e.g., 5/3).
3. **Mixed Numbers:** A whole number combined with a proper fraction (e.g., 1 1/2).

Examples:

- Proper fraction: 3/4 (where 3 < 4)
- Improper fraction: 5/3 (where 5 > 3)
- Mixed number: 1 1/2 (which is equivalent to 3/2)

Questions:

1. Write three examples of proper fractions.
2. Convert the improper fraction 7/4 into a mixed number.
3. What is the sum of 1/2 and 1/3?
4. How do you simplify the fraction 6/8?

3.Science

1.1 Food: Where does it come from?

Food is a basic necessity for all living organisms. It provides the energy and nutrients required for growth, repair, and maintenance of body functions. Food can be classified into two main categories: plants and animals.

Sources of Food:

1. **Plant Sources:**
   - Fruits: Apples, bananas, oranges.
   - Vegetables: Carrots, spinach, potatoes.
   - Grains: Rice, wheat, oats.
2. **Animal Sources:**
   - Meat: Chicken, beef, pork.
   - Dairy: Milk, cheese, yogurt.
   - Eggs: Chicken eggs, duck eggs.

Examples:

- **Fruits:** Strawberries grow on plants and are a source of vitamins.
- **Vegetables:** Spinach is rich in iron and helps in building strength.
- **Grains:** Rice is a staple food in many countries and provides carbohydrates.

Questions:

1. Name three fruits and their nutritional benefits.
2. List two animal sources of food and their importance.
3. Why are grains considered essential in our diet?
4. Describe the difference between plant and animal sources of food.

1.2 Components of Food

Food consists of various components that are necessary for the body to function properly. The main components of food are carbohydrates, proteins, fats, vitamins, and minerals.

Components of Food:

1. **Carbohydrates:** Provide energy.
   - Example: Rice, bread, pasta.
2. **Proteins:** Essential for growth and repair.
   - Example: Meat, beans, nuts.
3. **Fats:** Provide energy and support cell growth.
   - Example: Butter, oils, nuts.
4. **Vitamins:** Support various body functions.
   - Example: Vitamin C in citrus fruits.
5. **Minerals:** Essential for body processes.
   - Example: Calcium in dairy products.

Examples:

- **Carbohydrates:** Bread and rice are rich in carbohydrates and are primary energy sources.
- **Proteins:** Chicken and fish provide essential amino acids for muscle growth.
- **Fats:** Olive oil and butter are sources of healthy fats that support brain function.

Questions:

1. What are the main components of food?
2. Explain the role of proteins in our diet.
3. Why are vitamins important for our health?
4. List two sources of fats and their health benefits.

1.3 Fibre to Fabric

Fibre refers to the raw material used to make fabrics. The journey from fibre to fabric involves several processes, including harvesting, spinning, and weaving.

Types of Fibres:

1. **Natural Fibres:**
   - o Cotton: Grown in fields, harvested, and processed to make fabric.
   - o Wool: Obtained from sheep and processed to produce warm clothing.
2. **Synthetic Fibres:**
   - o Polyester: Made from petrochemicals through chemical processes.
   - o Nylon: A synthetic fibre known for its strength and durability.

Examples:

- **Cotton Fabric:** Soft and breathable, ideal for summer clothing.
- **Wool Fabric:** Warm and insulating, perfect for winter wear.

Questions:

1. What is the difference between natural and synthetic fibres?
2. Describe the process of making cotton fabric from fibre.
3. List two uses of wool in daily life.
4. What are the advantages of synthetic fibres over natural fibres?

1.4 Sorting Materials into Groups

Sorting materials into groups is an essential skill in science. It helps in understanding the properties and uses of different materials based on their characteristics.

Classification:

1. **Based on Physical Properties:**
   - o Solid: Wood, metal, glass.
   - o Liquid: Water, oil, milk.
   - o Gas: Oxygen, carbon dioxide.
2. **Based on Composition:**
   - o Pure Substances: Elements and compounds (e.g., water, salt).
   - o Mixtures: Combination of two or more substances (e.g., salad, air).

Examples:

- **Solids:** Metals like iron and non-metals like sulfur.
- **Liquids:** Water and vegetable oil.
- **Gases:** Oxygen and nitrogen in the air.

Questions:

1. List three examples of solids, liquids, and gases.
2. What is a pure substance? Give two examples.
3. How can you differentiate between a mixture and a compound?
4. Why is sorting materials important in science?

1.5 Separation of Substances

Separation of substances is a fundamental process in science used to obtain pure substances from mixtures. Various methods can be employed based on the properties of the substances.

Methods of Separation:

1. **Filtration:** Used to separate solids from liquids.
   - o Example: Using a filter paper to separate tea leaves from brewed tea.
2. **Evaporation:** Used to separate a soluble solid from a liquid.
   - o Example: Evaporating saltwater to obtain salt.
3. **Distillation:** Used to separate mixtures based on boiling points.
   - o Example: Distilling alcohol from fermented mixtures.

Examples:

- **Filtration:** Separating sand from water using a sieve.
- **Evaporation:** Obtaining sugar from sugar solution by evaporation.

Questions:

1. Explain the process of filtration and where it can be applied.
2. What is distillation, and how is it used in everyday life?
3. Provide an example of a situation where evaporation is used.
4. Why is it important to separate substances in chemistry?

1.6 Changes Around Us

Changes occur in our surroundings all the time. These changes can be classified as physical or chemical changes based on their nature.

Types of Changes:

1. **Physical Changes:** Do not change the chemical composition of a substance.
   - Example: Melting ice, dissolving sugar in water.
2. **Chemical Changes:** Result in the formation of new substances.
   - Example: Rusting of iron, burning of wood.

Examples:

- **Physical Change:** Crushing a can; it remains aluminum.
- **Chemical Change:** Baking a cake; new substances are formed.

Questions:

1. What is the difference between physical and chemical changes?
2. Give two examples of physical changes that occur in daily life.
3. What happens during a chemical change?
4. Why is understanding changes around us important in science?

4.Social Science

1.1 Geography

Geography is the study of the Earth's landscapes, environments, and the relationships between people and their environments. It helps us understand the physical features of the Earth and how they influence human activities.

Key Concepts:

- **Physical Geography:** The study of natural features like mountains, rivers, and climates.
- **Human Geography:** The study of human activities, cultures, and their interactions with the environment.

Examples:

- The Himalayas are the highest mountain range in the world.
- The Amazon Rainforest is known for its biodiversity.

Questions:

1. What is geography, and why is it important?
2. Differentiate between physical geography and human geography.
3. Name three major mountain ranges in the world.
4. How do natural features affect human activities?

1.2 The Earth in the Solar System

The Earth is the third planet from the Sun in our solar system. Understanding its place in the solar system helps us learn about its formation, characteristics, and interactions with other celestial bodies.

Key Facts:

- The solar system consists of the Sun and the objects that orbit it, including planets, moons, asteroids, and comets.
- The Earth orbits the Sun at an average distance of about 93 million miles.

Examples:

- The inner planets (Mercury, Venus, Earth, Mars) are rocky, while the outer planets (Jupiter, Saturn, Uranus, Neptune) are gas giants.
- Earth's unique atmosphere and conditions make it suitable for life.

Questions:

1. What is the solar system?

2. Name the eight planets in order from the Sun.
3. Why is Earth considered a unique planet?
4. Describe the characteristics of the inner and outer planets.

1.3 Globe, Latitude, and Longitude

A globe is a three-dimensional representation of the Earth. Latitude and longitude are the coordinate system used to locate places on the Earth's surface.

Key Concepts:

- **Latitude:** The distance north or south of the Equator, measured in degrees. Lines of latitude are horizontal.
- **Longitude:** The distance east or west of the Prime Meridian, also measured in degrees. Lines of longitude are vertical.

Examples:

- The Equator is at 0° latitude.
- The Prime Meridian is at 0° longitude.

Questions:

1. What is the purpose of a globe?
2. Explain the difference between latitude and longitude.
3. What are the coordinates of the Equator?
4. How do latitude and longitude help in navigation?

1.4 History

History is the study of past events, particularly in human affairs. It helps us understand how societies evolve and how past events shape the present and future.

Key Concepts:

- **Chronology:** The arrangement of events in the order they occurred.
- **Primary Sources:** Original documents or artifacts from a specific time period (e.g., letters, photographs).

Examples:

- The invention of the wheel is a significant development in human history.
- Ancient civilizations like Mesopotamia, Egypt, and the Indus Valley had advanced societies.

Questions:

1. Why is the study of history important?
2. Define chronology and its significance in historical studies.
3. What are primary sources? Give two examples.
4. Name three ancient civilizations and their contributions.

1.5 From Hunting and Gathering to Growing Food

The transition from hunting and gathering to agriculture marked a significant turning point in human history. This change allowed for the development of settled communities and the rise of civilizations.

Key Concepts:

- **Hunting and Gathering:** The lifestyle of early humans who relied on wild plants and animals for food.
- **Agriculture:** The practice of cultivating crops and raising animals for food.

Examples:

- Early humans used tools to hunt animals and gather fruits, nuts, and seeds.
- The development of farming techniques led to surplus food, which allowed populations to grow.

Questions:

1. Describe the lifestyle of hunting and gathering.
2. How did agriculture change human societies?
3. What are some early farming techniques used by humans?
4. Why was the development of surplus food significant?

1.6 In the Earliest Cities

The earliest cities emerged as a result of agricultural advancements and population growth. These cities became centers of trade, culture, and governance.

Key Concepts:

- **Urbanization:** The process of populations moving from rural to urban areas.
- **Civilization:** A complex society characterized by urban development, social stratification, and centralized governance.

Examples:

- Ancient cities like Uruk and Babylon in Mesopotamia were among the first urban centers.
- The Indus Valley Civilization included well-planned cities like Harappa and Mohenjo-Daro.

Questions:

1. What factors contributed to the rise of the earliest cities?
2. Define urbanization and its impact on society.
3. Name two ancient cities and their significance.
4. How did the development of cities influence trade and culture?

1.7 What Books and Burial Tell Us

Books and burial practices provide valuable insights into ancient societies, including their beliefs, customs, and social structures.

Key Concepts:

- **Literature:** Written works that reflect the culture and values of a society.
- **Burial Practices:** Rituals and customs related to the treatment of the dead, which can reveal beliefs about life and death.

Examples:

- Ancient texts like the Epic of Gilgamesh offer insights into Mesopotamian culture and mythology.
- Burial artifacts, such as pottery and tools, provide clues about the daily lives of ancient people.

Questions:

1. Why are books important for understanding history?
2. What can burial practices tell us about a civilization's beliefs?
3. Give an example of an ancient literary work and its significance.
4. How do artifacts found in graves contribute to our knowledge of past societies?

1.8 Understanding Diversity

Diversity refers to the variety of cultures, ethnicities, and experiences within a society. Recognizing and appreciating diversity is essential for promoting inclusivity and social harmony.

Key Concepts:

- **Cultural Diversity:** The presence of multiple cultural groups within a society.
- **Ethnic Diversity:** The existence of various ethnic groups with distinct cultural identities.

Examples:

- Countries like India and the United States are known for their cultural and ethnic diversity.
- Festivals and traditions from different cultures enrich a society's social fabric.

Questions:

1. What is diversity, and why is it important in society?
2. Define cultural diversity and give two examples.
3. How does understanding diversity contribute to social harmony?
4. Name a festival that celebrates cultural diversity.

1.9 Diversity and Discrimination

While diversity enriches societies, discrimination can undermine social cohesion. Understanding the causes and effects of discrimination is essential for promoting equality.

Key Concepts:

- **Discrimination:** Unfair treatment of individuals based on characteristics such as race, gender, or religion.
- **Equality:** The state of being equal in rights and opportunities.

Examples:

- Racial discrimination can manifest in various forms, including segregation and unequal treatment.
- Laws and policies that promote equality help combat discrimination.

Questions:

1. What is discrimination, and how does it affect individuals and communities?
2. Describe the difference between equality and equity.
3. Give an example of a law that promotes equality.
4. How can individuals and communities work to reduce discrimination?

1.10 What is Government?

Government refers to the system or group of people governing an organized community, often a state. It establishes laws, provides public services, and protects the rights of citizens.

Key Concepts:

- **Types of Government:** Democracy, monarchy, dictatorship, etc.
- **Functions of Government:** Making laws, enforcing laws, providing services, and protecting citizens.

Examples:

- A democratic government allows citizens to participate in decision-making through voting.
- A monarchy is a government ruled by a king or queen.

Questions:

1. Define government and its primary functions.
2. What are the different types of government? Give examples.
3. How does a democratic government differ from a dictatorship?
4. Why is citizen participation important in a democracy?

5.Mental Ability

1.1 Number Series

Number series problems involve identifying patterns in a sequence of numbers. The objective is to determine the next number in the series based on the observed pattern.

Examples:

1. **Series:** 2, 4, 6, 8, ...
   - o **Pattern:** Each number increases by 2.
   - o **Next Number:** 10
2. **Series:** 5, 10, 20, 40, ...
   - o **Pattern:** Each number is multiplied by 2.
   - o **Next Number:** 80

Questions:

1. What is the next number in the series: 3, 6, 9, 12, ...?
2. Find the missing number in the series: 1, 4, __, 16, 25.
3. What is the next number in the series: 10, 20, 30, 40, ...?
4. Identify the pattern and find the next number: 2, 5, 10, 17, ...?

1.2 Alphabet Series

Alphabet series problems involve identifying patterns in sequences of letters. These problems test knowledge of the English alphabet and help in recognizing patterns.

Examples:

1. **Series:** A, C, E, G, ...
   - o **Pattern:** Each letter is two places ahead in the alphabet.
   - o **Next Letter:** I
2. **Series:** Z, Y, X, W, ...
   - o **Pattern:** The letters are in reverse order.
   - o **Next Letter:** V

Questions:

1. What is the next letter in the series: B, D, F, H, ...?
2. Find the missing letter in the series: A, C, __, E, G.
3. Identify the pattern and find the next letter: K, M, O, Q, ...?
4. What letter comes next in the series: X, W, V, U, ...?

1.3 Alphabet Test

Alphabet tests involve determining the position of letters in the English alphabet or finding relationships between different letters.

Examples:

1. **Position:** A = 1, B = 2, C = 3, ...
   - **Question:** What is the position of the letter D?
     - **Answer:** 4
2. **Reverse Position:** Z = 1, Y = 2, X = 3, ...
   - **Question:** What is the reverse position of the letter A?
     - **Answer:** 26

Questions:

1. What is the position of the letter F in the English alphabet?
2. If A = 1, what is the sum of the positions of the letters A, B, and C?
3. What is the reverse position of the letter M?
4. Find the letter that is 3 positions after J in the alphabet.

1.4 Mathematical Operation

Mathematical operation problems involve performing calculations based on given instructions or patterns. These problems help improve numerical skills and logical thinking.

Examples:

1. **Operation:** 5 + 3 × 2
   - **Solution:** 5 + 6 = 11
2. **Operation:** (10 - 2) × 4
   - **Solution:** 8 × 4 = 32

Questions:

1. Solve: 6 + 4 × 3 - 2.
2. What is the result of 15 ÷ 3 + 5 × 2?
3. If you subtract 7 from 20 and then multiply the result by 3, what do you get?
4. Calculate: (12 - 4) ÷ 2 + 5 × 3.