ADDITIONS & SUBTRACTIONS

ADDITION (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. The first step in 4-digit addition with regrouping is **b) Align the numbers vertically by their place value columns**. This ensures that each digit is correctly added in its respective column.

2. If the sum of any column exceeds 9 in 4-digit addition with regrouping, the action taken is **c) Regroup or carry over the extra value to the next higher place value column**. This means you take the ten's place of the sum and add it to the next column on the left.

3. The sum of the ones place is calculated **a) By adding the digits in the ones place column**. You simply add the digits that are in the ones column to find the total for that place value.

4. After the ones place, the next place value column is the **b) Tens place**. The order of place value from right to left is: ones, tens, hundreds, thousands, and so on.

ADVANCED LEVEL

More than One Answer Type

5. To ensure that each place value is correctly accounted for in the addition process, the following options are relevant:

- b) Regrouping or carrying over as needed: This helps manage any sums that exceed the value of the place, ensuring the correct totals in the higher place values.

- d) Aligning the numbers vertically: This ensures that each digit is in the correct place value column, allowing for accurate addition.

So, the correct answers are b and d.

6. The true statements about the addition process are:

- c) It may require regrouping when the sum exceeds 9: This is true, as regrouping (or carrying over) is necessary when the sum of a column exceeds 9.

The other options are not true:

- a) It starts from the leftmost column: Addition starts from the rightmost column (the ones place).

- b) It involves subtracting the numbers: Addition does not involve subtraction.

- d) It only works for 4-digit numbers: Addition works for any number of digits, not just 4-digit numbers.

So, the correct answer is c.

Fill In the Blanks

7. Remember, the key is to work from **right** to **left**, carrying over any excess value to the next higher place value column as needed, until all columns have been added.

8. So, the sum of **30,000** and **12,185** is 42,185.

Matching Type

9. Here's the matching for each item:

1. Definition of addition ---- C) Combining numbers to find their sum

2. Example of 4-digit addition with regrouping ---- D) Addition of 1,234 and 5,678

3. Process for 5-digit addition with regrouping ---- B) Working from right to left, carrying over excess values

4. Key principle for successful addition ---- A) Aligning numbers vertically by place value columns

Summary of Matches:

1 - C 2 - D 3 - B 4 - A

Answer the Following Questions

10. To add 7349 and 4986, align the numbers by place value and add each column from right to left:

```
  7349
+ 4986
-------
```

Step-by-step Addition:
1. Ones place: 9+6=15
Write down 5 and carry over 1.
2. Tens place: 4+8+1=13
Write down 3 and carry over 1.
3. Hundreds place: 3+9+1=13
Write down 3 and carry over 1.
4. Thousands place: 7+4+1=12
Write down 2 and carry over 1.
Since we have a carry over in the thousands place, write down 1.
Final Result:
Putting it all together, the sum is:

```
  7349
+ 4986
-------
 12335
```

So, 7349+4986=12335.

11. To add 54978 and 36792, align the numbers by place value and add each column from right to left:

```
  54978
+  36792
---------
```

Step-by-step Addition:
1. Ones place: 8+2=10
Write down 0 and carry over 1.
2. Tens place: 7+9+1=17
Write down 7 and carry over 1.
3. Hundreds place: 9+7+1=17

Write down 7 and carry over 1.
4. Thousands place: 4+6+1=11
Write down “1“1 and carry over 1.
5. Ten thousands place: 5+3+1=9
Write down 9.
Final Result:
Putting it all together, the sum is:

```
  54978
+ 36792
---------
  91770
```

So, 54978+36792=91770.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ’s)

Multiple Choice Questions

1. The correct answer is **d) Combining two or more numbers to find their sum**. Addition is the mathematical operation of finding the total by combining numbers.

2. The symbol that represents addition in mathematical notation is d) "+".

3. The sum of 8 and 7 is 8 + 7 = 15 c) 15.

4. Regrouping in addition is **c) Carrying over the extra value to the next higher place value column**. This process is used when the sum of a column exceeds 9, allowing for correct totals in the higher place values.

ADVANCED LEVEL

More than One Answer Type

5. In 4-digit addition with regrouping, the columns involved are:

- a) Units (or Ones), - b) Tens, - c) Hundreds, - d) Thousands.

The e) Ten thousands column is not involved in 4-digit addition, as it only applies when dealing with 5-digit numbers. So, the correct columns are a, b, c, and d.

6. After adding the digits in the tens place column, you typically write down:

- a) The sum: This is what you write in the tens column.

If the sum exceeds 9 and you have a carry over, you would also consider:

- b) The carried over value: This is added to the next column (the hundreds place), but it's not written down in the tens place column itself.

So, the correct answers are a and b.

Fill In the Blanks

7. So, the sum of 1,234 and 5,678 is **6,912**.

8. In mathematical notation, addition is denoted by the "+" symbol.

Matching Type

9. Here's the matching for each item:

1. Example of 4-digit addition with regrouping --- b. Addition of 1,234 and 5,678

2. Key principle for successful addition ---- c. Aligning numbers vertically by place value columns

3. Process for 5-digit addition with regrouping ---- d. Working from right to left, carrying over excess values

Summary of Matches:

1 - b, 2 - c, 3 - d

Answer the Following Questions

10. To add 5873 and 2893, align the numbers by place value and add each column from right to left:

  5873

+ 2893

Step-by-step Addition:
1. Ones place: 3+3=6
Write down 6.
2. Tens place: 7+9=16
Write down 6 and carry over 1.
3. Hundreds place: 8+8+1=17
Write down 7 and carry over 1.
4. Thousands place: 5+2+1=8
Write down 8.

Final Result:
Putting it all together, the sum is:
  5873

+ 2893

  8766

So, 5873+2893=8766.

11. To add 78932 and 48231, align the numbers by place value and add each column from right to left:
  78932

+ 48231

Step-by-step Addition:
1. Ones place: 2+1=3
Write down 3.
2. Tens place: 3+3=6
Write down 6.
3. Hundreds place: 9+2=11
Write down 1 and carry over 1.
4. Thousands place: 8+8+1=17
Write down 7 and carry over 1.
5. Ten thousands place: 7+4+1=12
Write down 2 and carry over 1
(which will become the hundred thousands).

Final Result:

Putting it all together, the sum is:

```
  78932
+ 48231
--------
 127163
```

So, 78932+48231=127163.

PROPERTIES OF ADDITION (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. According to the Associative Property, changing the grouping of numbers in an addition **b) does not affect the result**. The sum remains the same regardless of how the numbers are grouped.

2. The property of addition that emphasizes that changing the order of numbers being added does not change the result is the **b) Commutative Property**.

3. Estimating sums by rounding off involves **b) Simplifying numbers by rounding them to a certain place value**. This method makes it easier to perform mental calculations to find an approximate sum.

4. After rounding 129.8 to the nearest tenth, the value obtained is **c) 130.0**.

ADVANCED LEVEL

More than One Answer Type

5. The properties of addition illustrated in the equation $2 + 7 = 7 + 2 = 9$ are:

- c) Commutative Property**: This property states that changing the order of the numbers does not change the sum, as shown by $2 + 7 = 7 + 2$.

- a) Closure Property: This property states that the sum of any two real numbers is also a real number. In this case, both 2 and 7 are real numbers, and their sum 9 is also a real number.

So, the correct answers are a and c.

6. The property of addition that emphasizes the existence of an additive inverse is:

- d) Inverse Property: This property states that for every number a , there exists an additive inverse (or opposite) -a such that a + (-a) = 0.

The c) Identity Property also relates to the concept of additive inverses in that it involves adding zero, which is the identity element, but it primarily emphasizes that adding zero does not change a number.

So, the primary answer is **d) Inverse Property**, but **c) Identity Property** is also related in a broader sense.

Fill In the Blanks

7. The **Identity Property** states that adding zero to any number leaves that number unchanged.

8. The **Associative Property** states that when adding three or more numbers, the grouping of the numbers does not affect the result.

Matching Type

9.

1. What does estimating sums by rounding off involve? ---- C. To quickly approximate the sum.
2. How do you round the numbers in the process of estimating sums? ---- b. Round each number to the nearest hundred or tenth.
3. What is the purpose of adding the rounded numbers? ---- a. Simplifying numbers to a certain place value.
4. What should be remembered about the accuracy of this method? ---- d. It introduces some level of error, especially if the numbers are rounded to different place values.

So, 1 - C, 2 - B, 3 - A, 4 - D

Answer the Following Questions

10. The property that states that for every real number, there exists an

additive inverse such that their sum equals zero is the **Inverse Property** of addition.

11. The property that states that changing the order of the numbers being added does not change the result is the **Commutative Property**.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. To estimate the sum of 347 and 592 by rounding:

- Rounding 347 to the nearest hundred gives 300 .

- Rounding 592 to the nearest hundred gives 600.

Now, adding the rounded values: 300 + 600 = 900

So, the sum after rounding is **b) 900**.

2. The Identity Property of addition states that **a) Adding any number to zero gives the original number.** This property emphasizes that zero is the identity element for addition.

3. The property that emphasizes that adding zero to any number leaves that number unchanged is the **c) Identity Property**.

4. In the first example of Estimating Sums by Rounding Off, rounding 347 to the nearest hundred results in **a) 300**.

ADVANCED LEVEL

More than One Answer Type

5. In the equations 6 + 0 = 6 and -3 + 0 = -3 , the property being highlighted is:

- **a) Identity Property**: This property states that adding zero to any number leaves that number unchanged.

- **d) Addition of Zero**: This is a specific aspect of the identity property that emphasizes the effect of adding zero.

So, the correct answers are **a)** and **d)**.

6. Estimating sums by rounding off might be **not useful** because:

- **A) It guarantees exact values**: This is false; estimating does not guarantee exactness.

- **C) It eliminates the need for approximation**: This is also false; estimating sums involves approximation.

- **D) It increases the level of precision**: This is false; estimating typically reduces precision since it involves rounding.

So, the correct answers indicating why it might be **not useful** are **A)**, **C)**, and **D)**, as they suggest outcomes that do not align with the purpose of estimating. However, all options presented are misleading, so the correct understanding is that estimating does not guarantee precision or exactness.

Fill In the Blanks

7. The **Commutative** property states that changing the order of the numbers being added does not change the result.

8. The **Inverse** property states that for every real number, there exists an additive inverse such that their sum equals zero.

Matching Type

9. Here's the matching for each item:

1. What property states that adding zero to any number leaves that number unchanged? ---- a. Identity Property

2. Which property emphasizes that changing the order of the numbers being added does not change the result? ---- b. Commutative Property

3. Which property involves adding two real numbers to result in another real number? ---- c. Closure Property

4. Which property involves the grouping of numbers not affecting the result when adding three or more numbers? ---- d. Associative Property

Summary of Matches:

1 - a, 2 - b, 3 - c, 4 - d

Answer the Following Questions

10. The property that involves adding two real numbers to result in another real number is the **Closure Property**.

11. To estimate the sum of 347+592 when rounded to the nearest hundred:
Round 347 to the nearest hundred: 347 rounds to 300.
Round 592 to the nearest hundred: 592 rounds to 600.
Now, add the rounded values:
300+600=900
So, the estimated sum is 900.

SUBTRACTION (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. When subtracting 5,294 from 8,630 , you need to borrow in the **b) Tens** column.

Here's a breakdown:

- Subtracting 4 (from 5,294) from 0 in the ones column requires borrowing.

- This borrowing affects the tens column, as 3 from 8,630 will become 2 after borrowing 1 (which becomes 10 in the ones column).

So, the answer is b) Tens.

2. To find the difference when subtracting 5,294 from 8,630: 8,630-5,294
Step-by-step Calculation:
1. Ones place: 0-4 (need to borrow)
Borrow 1 from the tens place: 10-4=6
Now the tens place is 2 (after borrowing).
2. Tens place: 2-9 (need to borrow again)
Borrow 1 from the hundreds place: 12-9=3
Now the hundreds place is 5 (after borrowing).

3. Hundreds place: 5-2=3
4. Thousands place: 8-5=3
Putting it all together:
So, the difference is: 3,336
The correct answer is a) 3,336.

3. When subtracting 4 from 9 in the tens column, there is no need to borrow, since 9 is greater than 4. Therefore, borrowing would not occur in this case.

However, if you were referring to a situation where you needed to borrow to make 9 in the tens column (from a larger number in the hundreds column), you would borrow from the **c) Hundreds** column.

So, the answer is **c) Hundreds** if borrowing is involved in a larger subtraction scenario.

4. To find the difference between 72,451 and 35,892:
72,451-35,892
Step-by-step Calculation:
1. Ones place: 1-2 (need to borrow)
Borrow 1 from the tens place: 11-2=9 Now the tens place is 4 (after borrowing).
2. Tens place: 4-9 (need to borrow again)
Borrow 1 from the hundreds place: 14-9=5 Now the hundreds place is 3 (after borrowing).
3. Hundreds place: 3-8 (need to borrow again)
Borrow 1 from the thousands place: 13-8=5 Now the thousands place is 7 (after borrowing).
4. Thousands place: 7-5=2
5. Ten thousands place: 7-3=4
Putting it all together: So, the final difference is: 36,559
The correct answer is a) 36,559.

ADVANCED LEVEL

More than One Answer Type

5. When subtracting 5-digit numbers, if the digit in the top number is smaller than the one below it, the process is to:

- a) Borrow: This is the primary action taken to facilitate the subtraction by borrowing from the next higher place value.

So, the correct answer is a) Borrow.

If considering options in a broader context:

- b) Add one is part of the borrowing process, as you effectively add 10 to the digit after borrowing from the next column.

The answer focuses mainly on **a, b** as the direct term for the process.

6. Subtraction can be applied to various types of numbers, including: a) Whole numbers, b) Fractions, c) Decimals

Fill In the Blanks

7. Starting from the ones column, when subtracting 5-digit numbers, if the top digit is smaller than the one below it, we **borrow** from the next higher column.

8. Subtraction can be applied to various types of numbers, including whole numbers, **fractions**, decimals, and even negative numbers.

Matching Type

9. Here's the matching for the results of the subtraction of 35,892 from 72,451:

1. Ones column ---- C. 9

2. Tens column ---- B. 5

3. Hundreds column ---- A. 6

4. Thousands column ---- D. 3

Summary of Matches:

1 - C, 2 - B, 3 - A, 4 - D

Answer the Following Questions

10. To subtract 3,289 from 8,742, you can set it up like this:
  8742

- 3289

Now, subtract starting from the right:
1. Units place: 2 - 9 ? can't do, so borrow 1 from the 4 (making it 3), giving 12. Now, 12 - 9 = 3.
2. Tens place: 3 - 8 ? can't do, so borrow 1 from the 7 (making it 6), giving 13. Now, 13 - 8 = 5.
3. Hundreds place: 6 - 2 = 4.
4. Thousands place: 8 - 3 = 5.
Putting it all together:

```
  8742
- 3289
------
  5453
```

So, 8,742 - 3,289 = 5,453.

11. To subtract 46,321 from 98,765, set it up like this:

```
  98765
- 46321
-------
```

Now, subtract starting from the right:
1. Units place: 5 - 1 = 4
2. Tens place: 6 - 2 = 4
3. Hundreds place: 7 - 3 = 4
4. Thousands place: 8 - 6 = 2
5. Ten-thousands place: 9 - 4 = 5
Putting it all together:

```
  98765
- 46321
-------
  52444
```

So, 98,765 - 46,321 = 52,444.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. The correct answer is **b) A mathematical operation to find the difference between two numbers.**

Explanation:

- Subtraction is one of the four basic arithmetic operations (the others being addition, multiplication, and division).

- It involves taking one number away from another, which results in the difference between the two numbers.

- For example, in the subtraction 8 - 3, the result (or difference) is 5.

- The other options represent different operations:

  - a) Addition finds the sum.

  - c) Multiplication finds the product.

  - d) Division finds the quotient.

Therefore, subtraction specifically relates to finding the difference between numbers.

2. The correct answer is **d) -**.

Explanation:

- The symbol - is used to indicate subtraction in mathematical expressions. For example, in the expression 5 - 3, the minus sign shows that you are subtracting 3 from 5.

- The other symbols represent different operations:

  - a) × represents multiplication.

  - b) ÷ represents division.

  - c) + represents addition.

So, d) - is the operation that represents subtraction.

3. The correct answer is b) -4.
Explanation:
When you subtract a larger number from a smaller number, the result is a negative number. In this case: 0-4=-4 So, the result of subtracting 4 from 0 is -4.

4. The correct answer is c) 1.
Explanation:
When you subtract 1 from 2 in the ones column: 2-1=1
So, the result of subtracting 1 from 2 is 1.

ADVANCED LEVEL

More than One Answer Type

5. Subtraction can be applied to all of the following types of numbers: a) Whole numbers, b) Fractions, c) Decimals, d) Negative numbers
Explanation:
Whole numbers: You can subtract whole numbers (e.g., 5-3=2).
Fractions: You can subtract fractions
Decimals: You can subtract decimals (e.g., 2.5-1.2=1.3).
Negative numbers: You can also subtract negative numbers (e.g., -3-(-2)=-3+2=-1).
In summary, subtraction can be applied to whole numbers, fractions, decimals, and negative numbers.

6. When subtracting 5-digit numbers, borrowing may be required in any of the columns depending on the specific numbers involved. However, the most common columns where borrowing might be needed are:
a. Ones column, b. Tens column, c. Hundreds column, d. Thousands column, e. Ten thousands column.
Explanation: Borrowing occurs when the top digit in a column is smaller than the bottom digit in that column. This can happen in any of the columns (ones, tens, hundreds, thousands, or ten thousands) during subtraction.
For example, if you need to subtract 5 from 2 in any column, borrowing will be necessary.
So, in general, all columns could potentially require borrowing based on the specific digits in those positions.

Fill In the Blanks

7. Subtraction of 5-digit numbers involves finding the difference between two numbers, each with **five** digits.

8. The difference between 8,630 and 5,294 is: 8,630 - 5,294 = 3,336.

So, the answer is **3,336**.

Matching Type

9. Here's the matching for the

1. Ones column ----- B. Borrow from the tens column if the top digit is smaller than the one below it.
2. Tens column ----- C. Borrow from the hundreds column if needed.
3. Hundreds column ----- D. Subtract the digit in the top number from the digit in the bottom number.
4. Thousands column ----- E. Borrow from the ten thousands column if needed.
5. Ten thousands column ----- A. Start subtracting from this column.

So, matching answer is 1 - B, 2 - C, 3 - D, 4 - E, 5 - A.

Answer the Following Questions

10. To subtract 2,389 from 6,517, set it up like this:

  6517

- 2389

Now, subtract starting from the right:

1. Ones place: 7 - 9 ---- can't do, so borrow 1 from the 1 (making it 0), giving 17. Now, 17 - 9 = 8.
2. Tens place: 0 - 8 ---- can't do, so borrow 1 from the 5 (making it 4), giving 10. Now, 10 - 8 = 2.
3. Hundreds place: 4 - 3 = 1.
4. Thousands place: 6 - 2 = 4.

Putting it all together:

  6517

- 2389

  4128

So, 6,517-2,389=4,128.

11. To subtract 35,892 from 72,451, set it up like this:

  72451

- 35892

Now, subtract starting from the right:
1. Ones place: 1 - 2 ---- can't do, so borrow 1 from the 5 (making it 4), giving 11. Now, 11 - 2 = 9.
2. Tens place: 4 - 9 ---- can't do, so borrow 1 from the 4 (making it 3), giving 14. Now, 14 - 9 = 5.
4. Hundreds place: 3 - 8 ---- can't do, so borrow 1 from the 2 (making it 1), giving 13. Now, 13 - 8 = 5.
5. Thousands place: 1 - 5 ---- can't do, so borrow 1 from the 7 (making it 6), giving 11. Now, 11 - 5 = 6.
6. Ten-thousands place: 6 - 3 = 3.
Putting it all together:
  72451

- 35892

  36559

So, 72,451-35,892=36,559.

PROPERTIES OF SUBTRACTIONS (KEY)

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. The correct answer is **c) Closure Property**.

Explanation:

- The Closure Property states that for any two numbers within a certain set (like integers or real numbers), the result of an operation (such as subtraction) will also be a number within that same set.

- In this case, when you subtract two numbers, the difference is always another number within the set of real numbers.

The other properties mentioned have different meanings:

- a) Commutative Property: States that the order of the numbers does not change the result (applicable to addition and multiplication, but not subtraction).

- b) Associative Property: Relates to how numbers are grouped in addition and multiplication, not subtraction.

- d) Identity Property of Zero: States that adding or subtracting zero does not change the value of a number.

So, the best choice is the Closure Property.

2. The correct answer is **c) Commutative Property**.

Explanation:

- The Commutative Property states that the order of the numbers does not affect the result of an operation. However, it's important to note that this property applies to addition and multiplication, not subtraction.

In the case of subtraction, changing the order does change the result (e.g., $5 - 3 \neq 3 - 5$). Therefore, while the question seems to refer to the commutative property, subtraction does not actually have this property.

To clarify:

- a) Closure Property: Relates to whether an operation on numbers within a set results in a number within that set.

- b) Associative Property: Concerns how numbers are grouped in addition or multiplication, not subtraction.

- d) Inverse Property: Relates to how a number and its inverse (e.g., adding and subtracting the same number) result in zero.

So, while the answer is c) Commutative Property as stated, it's essential to remember that subtraction does not truly follow this property.

3. To solve 12-(7-3), first, evaluate the expression inside the parentheses:
1. Calculate 7-3=4.
2. Now substitute back into the original expression: 12-4.
Finally, perform the subtraction: 12-4=8.
So, the correct answer is c) 8.

4. To solve 5-(3+2), first, evaluate the expression inside the parentheses:
1. Calculate 3+2=5.
2. Now substitute back into the original expression: 5-5.

Finally, perform the subtraction: 5-5=0.
So, the correct answer is a) 0.

ADVANCED LEVEL

More than One Answer Type

5. The other properties mentioned do not directly relate to the non-commutative nature of subtraction:
b. Closure Property: This states that performing an operation on numbers in a set results in a number that is also in that set.
c. Associative Property: This property concerns how numbers are grouped in addition or multiplication, not subtraction.
d. Identity Property of Zero: This property states that adding or subtracting zero does not change the value of a number.
So, the answer is b, c, d.

6. The other properties listed do not specifically demonstrate the non-distributive nature of subtraction:
b. Inverse Property: This relates to how a number and its inverse (like addition and subtraction) interact, but it doesn't address distribution.
c. Zero Property: This typically refers to the identity property (where adding or multiplying by zero yields zero) and is not related to distribution.
d. Closure Property: This refers to whether performing an operation on numbers in a set results in a number also in that set, but it does not relate to distribution.
So, the primary property that demonstrates the non-distributive nature of subtraction is b, c, d.

Fill In the Blanks

7. Subtracting a number and its inverse (or opposite) results in **zero**.

Explanation:

For any number x, its inverse (or opposite) is $-x$. When you subtract $-x$ from x:

$x - x = 0$.
So, the result is always zero.

8. Subtracting zero from a number leaves the number **unchanged**.

Explanation:

For any number x: x - 0 = x.
Thus, the result remains the same as the original number.

Matching Type

9. Here's the matching for the properties:

1. 10 - 5 = 5 ----- **B. Closure Property**

2. 8 - 3 = 5 ----- **B. Closure Property**

3. (12 - 7) - 3 = 5 - 3 = 2 ----- **A. Associative Property**

4. 10 - 0 = 10 ----- **C. Identity Property**

Explanation:

1. Closure Property: Both 10 - 5 and 8 - 3 show that the result is a number within the set of integers.

2. Closure Property: Same reasoning as above.

3. Associative Property: This illustrates how subtraction can be grouped (though typically, subtraction is not associative).

4. Identity Property: Subtracting zero from a number leaves the number unchanged.

Answer the Following Questions

10. The commutative property states that changing the order of the numbers in an operation does not change the result. However, subtraction is non-commutative, meaning that changing the order of the numbers does change the result.

Example:

Let's take two numbers: 5 and 3.

- If we perform the subtraction in one order:

  5 - 3 = 2

- Now, if we switch the order:

 3 - 5 = -2

Conclusion:
As you can see, 5 - 3 gives us 2, while 3 - 5 gives us -2. This clearly demonstrates that subtraction does not follow the commutative property

because changing the order of the numbers affects the result.
In summary, while addition and multiplication are commutative, subtraction is not.

11. The associative property states that the way numbers are grouped in an operation does not affect the result. However, subtraction is not associative, which means that changing the grouping of numbers can change the result.

Example:

Let's consider three numbers: 10, 5, and 2.

1. If we group the first two numbers and then subtract the third: (10 - 5) - 2 = 5 - 2 = 3

2. Now, if we change the grouping and subtract the last number first: 10 - (5 - 2) = 10 - 3 = 7
Conclusion:
In the first case, the result is 3, while in the second case, the result is 7. This illustrates that the grouping of numbers in subtraction affects the outcome, confirming that subtraction does not satisfy the associative property.

In summary, unlike addition and multiplication, where the associative property applies, subtraction does not have this property, and changing the grouping can lead to different results.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. The correct answer is **a) Identity Property of Zero**.
Explanation: The **Identity Property of Zero** states that when you subtract zero from any number, the result is the number itself. For example: x - 0 = x.

This property highlights that zero is the identity element for subtraction, meaning it does not change the value of the original number.

The other options refer to different concepts:

- b) Zero Property: Typically relates to multiplication, stating that any number multiplied by zero is zero.

- c) Inverse Property: Involves adding or subtracting a number to yield zero.

- d) Distributive Property: Relates to how multiplication distributes over addition or subtraction.

So, the correct choice is **a) Identity Property of Zero**.

2. The correct answer is **c) Associative Property**.

Explanation:

The Associative Property states that the way numbers are grouped in an operation does not affect the result. However, it's important to note that this property applies to addition and multiplication, but it does not apply to subtraction.

In subtraction, changing the grouping can change the result. For example, consider the numbers 10, 5, and 2:

1. Grouping as (10 - 5) - 2 gives 3.

2. Grouping as 10 - (5 - 2) gives 7.

This shows that subtraction does not satisfy the associative property, even though that's what the property would suggest in a general sense.

So, while the Associative Property is the term used, it’s crucial to remember that it does not hold true for subtraction.

3. To solve (12 - 7) - 3, follow these steps:

1. Calculate the expression inside the parentheses: 12 - 7 = 5

2. Now substitute that result into the expression: 5 - 3 = 2

So, the final result is **a) 2**.

4. The result of 10 - 0 is **c) 10**.

Explanation:

When you subtract zero from any number, the result is the original number itself: 10 - 0 = 10

So, the correct answer is **c) 10**.

ADVANCED LEVEL

More than One Answer Type

5. The other options do not directly relate to the non-zero aspect of subtraction:
b. Closure Property: This indicates that performing an operation on numbers in a set results in a number also in that set.
c. Commutative Property: This refers to the order of numbers not affecting the result, which does not apply to subtraction.
d. Identity Property of Zero: This states that subtracting zero from a number leaves the number unchanged.
So, the answer is b, c, d.

6. The other options do not directly demonstrate the non-identity property of zero for subtraction:
b. Closure Property: Refers to the result of an operation remaining within the same set.
c. Commutative Property: States that changing the order of numbers affects the result, which does not apply to subtraction.
d. Associative Property: Concerns how numbers are grouped, which also does not apply to subtraction.
So, the answer is b, c, d.

Fill In the Blanks

7. 8 - 8 = *0*.

8 Distributive Property: Subtraction **does not distribute** over addition.

Explanation:

In mathematics, the distributive property applies to multiplication, where $a(b + c) = ab + ac$. However, subtraction does not follow this property in the same way. For example:

$a - (b + c) \neq (a - b) + (a - c)$.

Instead, it is more accurate to say that subtraction is not distributive over addition.

Matching Type

9. Here's the matching for the properties:

1. 5 - (3 + 2) ---- **D. 0**

2. 8 - 8 ---- **C. 0**

3. 12 - (7 - 3) ---- **B. 8**

4. 10 - 0 ---- **A. 10**

Explanation:

1. 5 - (3 + 2) : This simplifies to 5 - 5 = 0.

2. 8 - 8 : This is equal to 0.

3. 12 - (7 - 3) : This simplifies to 12 - 4 = 8.

4. 10 - 0 : This equals 10.

Answer the Following Questions

10. The property that ensures that the result of subtracting two numbers is always another number is the **Closure Property**.

Explanation:

The Closure Property states that when you perform an operation (in this case, subtraction) on numbers from a certain set (like integers, rational numbers, or real numbers), the result will also be a number within that same set.

For example, if you subtract two integers, the result will also be an integer, confirming that subtraction is closed under the set of integers.

11. Subtraction **does not distribute** over addition in the same way that multiplication does. In fact, the distributive property specifically applies to multiplication, not subtraction.

Explanation:

The distributive property states that: $a(b + c) = ab + ac$

However, if we try to apply this idea to subtraction, we find that it does not hold. For example, consider the expression: $a - (b + c)$
If we were to incorrectly apply a distributive-like approach, one might think:

$a - (b + c) \neq (a - b) + (a - c)$

Example:

Let's use specific numbers to illustrate this:

Let a = 10, b = 3, and c = 2.

1. Calculate a - (b + c) : 10 - (3 + 2) = 10 - 5 = 5

2. Now calculate (a - b) + (a - c) : (10 - 3) + (10 - 2) = 7 + 8 = 15

As you can see: 10 - (3 + 2) = 5 and (10 - 3) + (10 - 2) = 15

Conclusion:

This example shows that subtraction does not distribute over addition, as the results are not equal. Thus, it’s important to remember that the distributive property does not apply to subtraction in the same manner it does for multiplication.