

Class 7 - Mathematics

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NUMBER PLAY

Class 7 Formula Sheet

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Use this Class 7 - Mathematics NUMBER PLAY Formula Sheet for quick revision before school exams and CBSE exams. It brings together important formulas, key concepts and worked examples in one place so students can revise faster and download a printable PDF for offline study.



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Important Formulas

CHAPTER 6: NUMBER PLAY

1. Sum of 2 even numbers = Even

Adding two even numbers results in an even number. Examples include $2 + 4 = 6$, which is even.

Example Question

If two even numbers are 8 and 10, what is their sum?

Solution

To find the sum of 8 and 10, we add them together: $8 + 10 = 18$. Since 18 is even, the result confirms the rule.



Key Takeaway: The sum of two even numbers is always even. If A and B are even numbers, then $A + B = \text{Even}$.

2. Sum of 2 odd numbers = Even

The addition of two odd numbers results in an even number. E.g., $3 + 5 = 8$.

Example Question

What is the sum of the odd numbers 7 and 9? Is the result even or odd?

Solution

To find the sum of 7 and 9, we calculate: $7 + 9 = 16$. Since 16 is an even number, the sum of 7 and 9, which are both odd numbers, is indeed even.



Key Takeaway: The sum of two odd numbers is always an even number. If a and b are odd numbers, then $a + b = \text{Even}$.



Important Formulas

CHAPTER 6: NUMBER PLAY

3. Sum of an even number and an odd number = Odd

Combining an even and an odd number yields an odd number. For instance, $2 + 3 = 5$.

Q Example Question

If an even number is 8 and an odd number is 5, what is the sum of these two numbers?

S Solution

To find the sum of 8 (even) and 5 (odd): 1. Write the numbers: $8 + 5$. 2. Perform the addition: $8 + 5 = 13$. 3. The result is 13, which is an odd number.



Key Takeaway: The sum of an even number (E) and an odd number (O) equals an odd number. Mathematically, this can be expressed as: $E + O = \text{Odd}$, where E is any even integer (e.g., 2, 4, 6, ...) and O is any odd integer (e.g., 1, 3, 5, ...).

4. Number of squares in a grid = Length $\times$ Width

The total number of squares in a rectangular grid can be calculated by multiplying the number of rows (length) by columns (width), e.g., in a 3x4 grid: $3 \times 4 = 12$.

Q Example Question

A rectangular grid has 5 rows and 8 columns. How many squares are in this grid?

S Solution

To find the number of squares in the grid, use the formula: Number of squares in a grid = Length $\times$ Width. Here, Length = 5 and Width = 8. So, Number of squares = $5 \times 8 = 40$. Therefore, there are 40 squares in the grid.



Key Takeaway: Number of squares in a grid = Length $\times$ Width, where Length is the number of rows and Width is the number of columns, measured in squares.



Important Formulas

CHAPTER 6: NUMBER PLAY

5. n th even number = $2n$

This formula gives the n th even number in a sequence. For $n = 1$, it returns 2, for $n = 2$, it returns 4, etc.

Q Example Question

What is the 5th even number?

S Solution

To find the 5th even number, use the formula n th even number = $2n$. Set $n = 5$: $2 * 5 = 10$. Therefore, the 5th even number is 10.



Key Takeaway: The n th even number can be found using the formula n th even number = $2n$, where n is a positive integer representing the position in the sequence of even numbers (1st, 2nd, 3rd, ...). For example, for $n = 1$, the formula gives the first even number which is 2.

6. n th odd number = $2n - 1$

This formula calculates the n th odd number. For $n = 1$, it returns 1, for $n = 2$, it returns 3, etc.

Q Example Question

What is the 10th odd number?

S Solution

To find the 10th odd number, substitute $n = 10$ into the formula: n th odd number = $2n - 1$. Thus, n th odd number = $2(10) - 1 = 20 - 1 = 19$. Therefore, the 10th odd number is 19.



Key Takeaway: The n th odd number can be calculated using the formula n th odd number = $2n - 1$, where n is a positive integer representing the position in the sequence of odd numbers. For example, if $n = 1$, the result is 1; for $n = 2$, the result is 3, and so on.



Important Formulas

CHAPTER 6: NUMBER PLAY

7. Parities of expressions: Even + Even = Even

Similar to the addition of even numbers, it reaffirms that the sum is even.

Q Example Question

If you add the even numbers 4 and 6, what is the sum?

S Solution

$4 + 6 = 10$; since both 4 and 6 are even numbers, their sum 10 is also even.



Key Takeaway: Even + Even = Even; where Even is any integer divisible by 2.

8. Parities of expressions: Odd + Odd = Even

Confirms that two odd numbers add up to an even number.

Q Example Question

If Alex has 3 odd numbered candies and Jamie has 5 odd numbered candies, what is the total number of candies they have?

S Solution

1. First, identify the odd numbers: 3 (Alex's) + 5 (Jamie's) = 8. 2. Since both numbers are odd, their sum is even. Therefore, the total number of candies is 8.



Key Takeaway: The sum of two odd numbers, represented as $(a + b)$, where both a and b are odd integers, results in an even number. Therefore, if a is an odd number (e.g., 3) and b is another odd number (e.g., 5), then $a + b = \text{even}$.



Important Formulas

CHAPTER 6: NUMBER PLAY

9. Parities of expressions: Even - Even = Even

Subtracting two even numbers always results in another even number.

Q Example Question

If $A = 10$ and $B = 4$, what is $A - B$?

S Solution

To find $A - B$, substitute the values of A and B into the expression: $A - B = 10 - 4$. Now, compute the result: $10 - 4 = 6$. Since 6 is an even number, this supports the formula $\text{Even} - \text{Even} = \text{Even}$.



Key Takeaway: If two expressions, A and B , are both even numbers, then the result of subtracting them ($A - B$) is also an even number. This can be represented as: $\text{Even} - \text{Even} = \text{Even}$.

10. Sum of children's numbers (based on height arrangement)

A child's number indicates how many of those in front are taller. Understanding height arrangements illustrates real-world applications of numbers.

Q Example Question

In a line of 7 children, the height arrangement is such that they say the following numbers: 0, 1, 1, 2, 4, 1, 5. What does each number represent?

S Solution

Each number represents the count of children who are taller in front of the respective child: 0 means no children are taller, 1 means 1 child is taller, 2 means 2 children are taller, and so forth, based on their height arrangement.



Key Takeaway: Sum of children's numbers = Number of taller children in front of a child. Each child reports how many of the children in front of them are taller, allowing for the calculation of their respective numbers based on height arrangement.



Worked Examples

1. If X is the number of boxes, and each box has 1 number | $X = 5$

This emphasizes the necessity of odd numbers in boxes. Understanding sums helps with problem-solving and logic.

2. Sum of ages = $(n) + (n+1)$

If Maria and Martin's ages differ by one, their combined ages can be expressed as the sum of consecutive numbers.

3. Let S = Sum of cards, $S = 30$

Kishor's challenge in arranging numbers in boxes results in an impossible sum when confined to odd numbers.

4. $2m + 3n = \text{Total}$ (even + odd considerations)

Mathematical representations signify relations of odd/even in sums; fundamental when dealing with parity.

5. For any positive integers: Even number total = $2(k)$, for $k = 1, 2, 3, \dots$

This reiterates the patterns in parity results.



Worked Examples

CHAPTER 6: NUMBER PLAY

6. $3x + 4 =$ Parity evaluation

Varying x provides insights to the alternation of parities depending on x being odd or even.

7. Square of an even number = Even

For example, $4^2 = 16$. Squares maintain parity.

8. Square of an odd number = Odd

For instance, $3^2 = 9$, retaining oddity.

9. $x = 2n + 1$ (determines odd numbers)

This gives insight into generating odd numbers.

10. Total coins = ₹1 + ₹5 + ₹10 = ₹205

Analyzing coin distributions using even and odd to achieve a specified total demonstrates practical applications of mathematical concepts.



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