

Class VII - Mathematics

Ganita Prakash

NUMBER PLAY

CBSE NOTES

NUMBER PLAY - Practice Worksheet

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Solve the following questions. Write your answers in the space provided.

1. Explain the rule of how children call out numbers based on their heights. Why is this arrangement important?

Hint: Consider how each child's perspective alters their count.

2. Discuss the meaning of the statement: 'If a person says '0', then they are the tallest in the group.' What are the conditions for this to be true?

Hint: Think about height positions and others' counts.



Solve the following questions. Write your answers in the space provided.

3. Is it possible for the ages of siblings born one year apart to sum to 112? Justify your answer using concepts from parity.

Hint: Check if consecutive integers can meet the even sum's requirement.

4. Identify the necessary conditions under which five odd numbers can sum to an even number. Explain why this is the case.

Hint: Think of whether odd and even can combine to form a target sum.



Solve the following questions. Write your answers in the space provided.

5. How can you determine the parity of sums of numbers without calculating their total leads? Provide examples.

Hint: Remember the rules of addition regarding parity.

6. Calculate and explain the parity of small squares in a grid of size 27×13 .

Hint: Examine the properties of multiplying odds and evens.



Solve the following questions. Write your answers in the space provided.

7. Describe a mathematical expression that always returns an odd result. Provide reasoning and examples.

Hint: Consider how manipulation of numbers can yield consistent parity.

8. Explore the parity resulting from the expression $3n + 4$. Provide examples with varying n values.

Hint: Analyze how changing n impacts the outcome.



Solve the following questions. Write your answers in the space provided.

9. Find the 100th odd number using a formula you created. Explain the derivation.

Hint: Reflect on how even numbers relate to odd numbers.



Check your answers with the solutions below.

1. Explain the rule of how children call out numbers based on their heights. Why is this arrangement important?

Solution: The children call out the number of children taller than them in front. This process allows us to understand relative heights, as each number corresponds to a positional relationship. For example, if a child sees three taller ones, they say '3'. This method provides insight into ordering and comparisons in our environment, helping us grasp concepts of measurement and comparison effectively. Visualizing or drawing heights can further enhance understanding.

2. Discuss the meaning of the statement: 'If a person says '0', then they are the tallest in the group.' What are the conditions for this to be true?

Solution: This statement means if someone hears a 0, it indicates no taller persons in front, implying they are indeed the tallest. However, it is true only if the person is at the front of the line. If they are not, the statement may not hold. For example, someone else could have a height similar to theirs who stands between them and the front. Hence, it's critical to assess positions and the heights of those around.

3. Is it possible for the ages of siblings born one year apart to sum to 112? Justify your answer using concepts from parity.

Solution: Since siblings are born one year apart, their ages are consecutive numbers (x and $x+1$). Given the sum, $x + (x + 1) = 112$ simplifies to $2x + 1 = 112$. Solving yields $2x = 111$, giving $x = 55.5$. Since ages must be whole numbers, they cannot sum to 112. Hence, the question demonstrates how consecutive numbers cannot produce an even sum. Using parity, we see odd+even can't yield even results.



Check your answers with the solutions below.

4. Identify the necessary conditions under which five odd numbers can sum to an even number. Explain why this is the case.

Solution: According to parity rules, the sum of odd numbers is always odd unless paired correctly. When summing five odd numbers, this will always yield an odd total. For example, $1+1+1+1+1=5$. If 5 boxes must contain 5 odd numbers summing to 30, it is impossible since 30 is even. Hence, understanding parity clarifies why this scenario fails.

5. How can you determine the parity of sums of numbers without calculating their total leads? Provide examples.

Solution: To determine parity, analyze the count of odd/even numbers in the sum. For instance, even + even is always even, odd + odd is always even, and even + odd is always odd. For example, the sum of 2 even numbers (4, 6) and 2 odd numbers (1, 3) is even. So, you can categorize and deduce the parity by knowing how many odds and evens exist in the sum without computation.

6. Calculate and explain the parity of small squares in a grid of size 27×13 .

Solution: Considering that rows and columns are odd, a product of an odd number (27) and an odd number (13) will also yield odd. Therefore, $27 \times 13 = 351$, which is odd. Here's the pattern: odd $\times$ odd = odd. Knowing this allows for parity checks of rectangular grids without the need for actual multiplication.

7. Describe a mathematical expression that always returns an odd result. Provide reasoning and examples.

Solution: An expression that generates odd results could be structured as $2n + 1$, where n is any integer. For instance, if $n = 2$, then $2(2) + 1 = 5$, and for $n = 3$, it gives 7. This consistent odd output path showcases how odd numbers arise by modifying even integers. Associating numbers this way strengthens numerical understanding.



Check your answers with the solutions below.

8. Explore the parity resulting from the expression $3n + 4$. Provide examples with varying n values.

Solution: The expression $3n + 4$ has varying outputs based on the parity of n . If n is odd (i.e., $n=1$), then output $3(1) + 4 = 7$ (odd). If n is even (i.e., $n=2$), then $3(2) + 4 = 10$ (even). This demonstrates how the expression sets up conditions for multiple outputs in terms of parity. Overall, both even and odd parities can emerge from changing n .

9. Find the 100th odd number using a formula you created. Explain the derivation.

Solution: To find the 100th odd number, use the formula $2n - 1$ where $n = 100$. Thus, $2(100) - 1 = 200 - 1 = 199$. This formula stems from recognizing that odd numbers can be framed as one less than the corresponding even number ($2n$). This method provides a direct way to pinpoint any odd number in a sequence.



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