

Class VII - Mathematics

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NUMBER PLAY

CBSE NOTES

NUMBER PLAY - Mastery Worksheet

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

1. Given a lineup of 7 children, where each calls out the number of children taller than them in front of them, create one possible arrangement that leads to the sequence [0, 1, 1, 2, 4, 1, 5]. Explain the arrangement logic and verify your reasoning.

Hint: Consider the tallest child first and test the heights in descending order.



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

2. Analyze the statement: 'If a person says '0', then they are the tallest in the group.' Is this Always True, Sometimes True, or Never True? Provide an example to support your answer.

Hint: Reflect on the meaning of the number in relation to child positions.

3. Kishor has five boxes which need to sum to 30 using odd numbered cards only. Demonstrate whether it's possible or not, and explain why.

Hint: Consider the properties of even and odd numbers in your reasoning.



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

4. Two siblings, Maria and Martin, are reportedly 112 years combined in age. Could this be true? Prove your reasoning using the properties of odd and even numbers.

Hint: Test with a few pairs of consecutive numbers and calculate their sums.

5. Based on the expressions provided, define your own algebraic expression that would always yield an even result. Justify your choices.

Hint: Think about even multiples and how they interact with the variable.



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

6. Evaluate the parity of the following scenarios: Sum of 3 odd numbers and 4 even numbers. Is the result even or odd? Explain your reasoning.

Hint: Use the properties of sums and checks for odd/even sums.

7. For the grids provided, can you deduce the parity of grids 27×13 , 42×78 , and 135×654 without calculating the products? Explain how.

Hint: Analyze the parity of individual dimensions before multiplying.



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

8. Address the statement: 'The parity of the sum of any two consecutive numbers is odd.' Give a detailed explanation and include examples to illustrate.

Hint: List out some consecutive pairs and calculate their sums.



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

9. Construct a problem around the parity of products. What scenarios result in even and odd products? Provide examples including different combinations of odd and even factors.

Hint: Explore combinations with multiple numbers to further validate.

10. Analyze and derive a formula that outputs the nth odd number. Explore this against the even number's formula and demonstrate your findings.

Hint: Work through values of n and illustrate your thought process.



Check your answers with the solutions below.

1. Given a lineup of 7 children, where each calls out the number of children taller than them in front of them, create one possible arrangement that leads to the sequence [0, 1, 1, 2, 4, 1, 5]. Explain the arrangement logic and verify your reasoning.

Solution: An arrangement could be: Child1 (tallest), Child2, Child3, Child4, Child5, Child6, Child7 (shortest). Based on relative heights, verify by checking each child's perspective and the total taller children ahead.

2. Analyze the statement: 'If a person says '0', then they are the tallest in the group.' Is this Always True, Sometimes True, or Never True? Provide an example to support your answer.

Solution: 'Always True.' If a child sees '0', it means no one taller is in front. For example, if Child7 says 0, that implies they are the only one or the tallest.

3. Kishor has five boxes which need to sum to 30 using odd numbered cards only. Demonstrate whether it's possible or not, and explain why.

Solution: It's not possible since adding 5 odd numbers results in an odd sum. Therefore, they cannot yield the even total of 30.

4. Two siblings, Maria and Martin, are reportedly 112 years combined in age. Could this be true? Prove your reasoning using the properties of odd and even numbers.

Solution: It's false; their ages being consecutive numbers means their combined sum is even, hence can't equal the even number 112.



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Check your answers with the solutions below.

5. Based on the expressions provided, define your own algebraic expression that would always yield an even result. Justify your choices.

Solution: An example is: $2n$, where n is a whole number. This produces only even numbers since all multiples of 2 are even.

6. Evaluate the parity of the following scenarios: Sum of 3 odd numbers and 4 even numbers. Is the result even or odd? Explain your reasoning.

Solution: The sum is even. $3 \text{ odd} = \text{odd} + \text{odd} = \text{even} + \text{even} = \text{even}$, combined with 4 even numbers (always even) results in even.

7. For the grids provided, can you deduce the parity of grids 27×13 , 42×78 , and 135×654 without calculating the products? Explain how.

Solution: The parity is odd for 27×13 (odd $\times$ odd = odd), even for 42×78 and 135×654 (even $\times$ even = even).

8. Address the statement: 'The parity of the sum of any two consecutive numbers is odd.' Give a detailed explanation and include examples to illustrate.

Solution: This is true, as one of the consecutive numbers is always even and the other is odd; thus, their sum is odd.

9. Construct a problem around the parity of products. What scenarios result in even and odd products? Provide examples including different combinations of odd and even factors.

Solution: The product is even if at least one factor is even. Examples: $(2, 3) = 6$ (even), $(3, 5) = 15$



Check your answers with the solutions below.

10. Analyze and derive a formula that outputs the n th odd number. Explore this against the even number's formula and demonstrate your findings.

Solution: The n th odd number is expressed as $2n - 1$. Comparably, the n th even number is $2n$, showing the consistent relationship in sequences.



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