MSMS
WINTER HOLIDAYS HOMEWORK
GRADE 8
SESSION -2025-26

Worksheet Based on Assertion and Reason Based Questions

(1) Both A and R are true, and R is the correct explanation of A.

(2) Both A and R are true, but R is not the correct explanation of A.

(3) A is true, but R is false.

(4) A is false, but R is true.

1. Assertion (A): When both factors in a product ab are increased by 1, the new product (a + 1)(b + 1) is always greater than the original product ab for any integers a and b.

Reason (R): The increase in the product is a + b + 1, which is always positive.

2. Assertion (A): The expression (a + m)(b + n) = ab + an + bm + mn is an identity.

Reason (R): It is obtained by applying the distributive property twice and holds true for all values of a, b, m, n.

3. Assertion (A): $(a + b)^2 = a^2 + 2ab + b^2$ is an identity that can be used even when a and b are fractions or negative numbers.

Reason (R): The identity is derived from the distributive property, which holds only for positive integers.

4. Assertion (A): In a 2x2 calendar block, the difference between diagonal products is 9.

Reason (R): If top left entry is n, diagonal are n(n+8) and (n+1)(n+7), whose diagonal difference is 7.

5. Assertion(A) :The difference between $(n+1)^2$ and $(n-1)^2$ is 2n.

Reason (R) : $(n+1)^2 - (n-1)^2 = 2n + 2$

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Worksheet Based on Case Based Questions

Case 1: A shopkeeper uses mental math tricks based on distributivity for fast billing. For prices like ₹11, he treats it as (10 + 1) and adds the number to its shifted version. For ₹101, he shifts by two places and adds. For ₹99, he uses (100 - 1) and subtracts the shifted number. This speeds up calculations during rush hours.

Based on the above information, answer the following questions:

(i) Compute 73 × 11 using the trick. Show digit-wise steps with carries.

(ii) Compute 456 × 101 using the trick. Show the placement.

(iii) Compute 528 × 99 using the (100 - 1) method. Find the product.

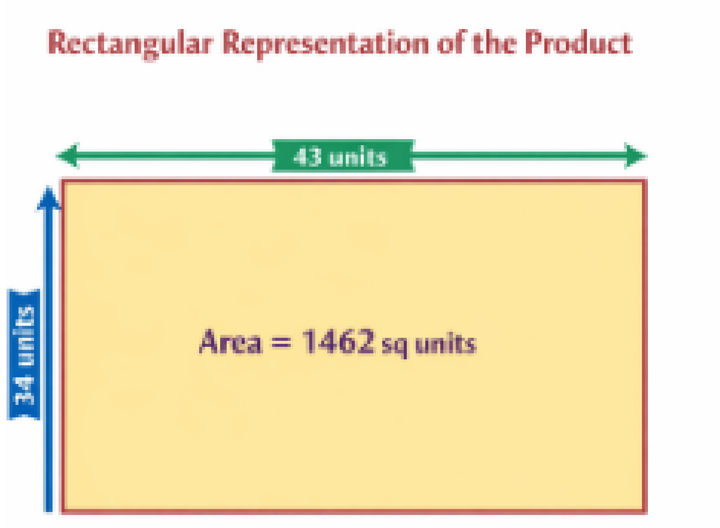
(iv) Compute 67 × 11 and explain briefly why the trick works using distributivity.

Case 2: Rohan is learning mental mathematics and algebraic reasoning. His teacher gives him a task to understand how small changes in numbers affect their product without performing actual multiplication.He represents this situation using a rectangular model, where the length is 34 units and the breadth is 43 units.

Based on the above information answer the following questions:

(i) If the length of the rectangle is reduced by 1 unit while the breadth remains the same, find the new area of the rectangle.

(b) If the breadth of the rectangle is increased by 1 unit while the length remains unchanged, determine the new area.



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Practice Worksheet - 3

A. Choose the correct options:

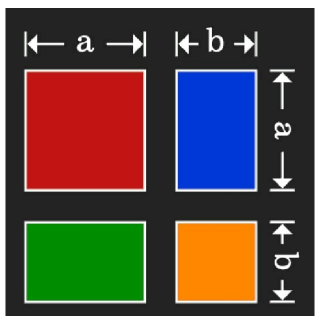
1. When both factors in the product ab are increased by 1, the increase in the product is:
a) a + b b) a + b + 1 c) 2ab d) ab + 1

2. When one factor is increased by 2 and the other decreased by 4, the change in product can be found using:
a) m = 2, n = 4 in Identity 1 b) m = 2, n = –4 in Identity 1
c) m = –2, n = 4 in Identity 1 d) Direct subtraction only

3. The identity for the square of a sum is:
a) $(a + b)^2 = a^2 + b^2 - 2ab$ b) $(a + b)^2 = a^2 + 2ab + b^2$
c) $(a + b)^2 = a^2 - 2ab + b^2$ d) $(a + b)^2 = a^2 + b^2$

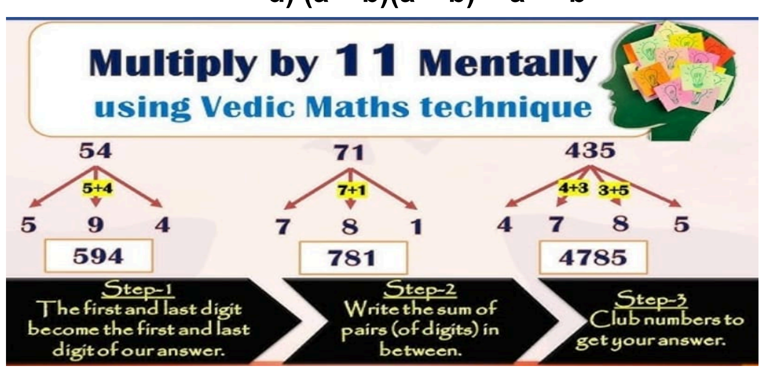
4. In the geometric diagram above for $(a + b)^2$, the two rectangles represent:
a) a^2 and b^2 b) ab each (total 2ab)
c) a + b d) The difference

5. The diagram above shows the geometric proof for:



a) $(a + b)^2$ b)$(a - b)^2$
c) $a^2 - b^2$ d) Distributivity

6. The difference of squares identity is:
a) $(a + b)(a - b) = a^2 + b^2$ b) $(a + b)(a - b) = a^2 - b^2$
c) $(a + b)(a + b) = a^2 - b^2$ d) $(a - b)(a - b) = a^2 + b^2$



7. The diagram above illustrates the trick for multiplying by:
a) 10 b) 11 c) 101 d) 99

B. Solve the following:

1. Check each of the simplifications and see if there is a mistake. If there is a mistake, then write the correct expression.

(a) $5w^2 + 6w = 11w^2$

(b) 2a3 + 3a3 + 6a2b + 6ab2 = $5a^3$ + 12a2b^2

(c) $(5m + 6n)^2 = 25m^2 + 36n^2$

(d) (-q + 2)2 = q2 – 4q + 4

(e) $3a(2b \times 3c) = 6ab \times 9ac = 54a^2bc$

2.Expand (a)$\frac{3}{2}a^2(a - b + 15)$

(b) (a + b) (a + b)

(c) $(a + b)(a^2 + 2ab + b^2)$

3. Create a fast multiplication rule for 999 and apply to 23478 × 999.

4. Prove that $2(a^2 + b^2 + c^2) = (a+b)^2 + (a-c)^2 + (b+c)^2 - 2ab + 2ac$ (adjust and verify).

E. Unscramble the word with the help of clues:

1. **TIVIYTSRBDIUTI**

Clue: Property used to expand a (b + c)

2. **TIDYNIET**

Clue: Equality true for all values, e.g. $(a+b)^2 = a^2 + 2ab + b^2$

3. **FECIECOTNIF**

Clue :Number multiplying a variable: crucial when collecting like terms

4. **TARASIFONCAOTI**

Clue: Reverse of expansion: rewrite as a product of simpler factors

5. **LONMIPOLYA**

Clue: Expression like $3x^2 - 5x + 7$

6. **NEXOPASIN**

Clue : Result of distributing; e.g., $(x + 3)(x + 4) = x^2 + 7x + 12$