

Chapter 09

ALGEBRAIC EXPRESSION & IDENTITIES

Multiplication of a Polynomial by a Polynomial:

Multiplication of a Binomial by a Binomial:

For multiplication of binomial by binomial of the type

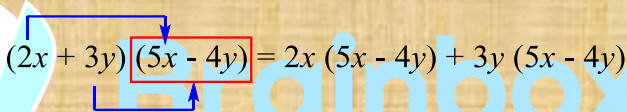
$$(P + Q)(R + S).$$

Example:

Multiply $\left(\frac{2x}{P} + \frac{3y}{Q}\right)$ and $\left(\frac{5x}{R} - \frac{4y}{S}\right)$

Step-1: Apply distributive property and obtain,

$$(P + Q)(R + S) = P(R + S) + Q(R + S)$$



$$(2x + 3y)(5x - 4y) = 2x(5x - 4y) + 3y(5x - 4y)$$

Step-2: Multiply further to get, $PR + PS + QR + QS$

$$= (2x \times 5x) + (2x \times 4y) + (3y \times 5x) + (3y \times -4y)$$

$$= 10x + (-8xy) + (15xy) + (-12y^2)$$

$$= 10x - 8xy + 15xy - 12y^2 \quad (\because \text{By product of signs})$$

$$= 10x + 7xy - 12y^2 \quad (\because \text{By simplify like terms})$$

$$\therefore \boxed{(2x + 3y)(5x - 4y) = 10x + 7xy - 12y^2}$$

Note:

Multiplication of binomial by a trinomial:

In this type of multiplication, we multiply each of the three terms in the trinomial by each of the two terms in the binomial and we get $3 \times 2 = 6$ terms, which may be reduced to 5 or less.