RS Aggarwal Solutions for Class 7 Maths chapter 6
Algebraic Expressions

## EXERCISE 6A

## PAGE: 99

1. **Add the following expressions:**

   i. **5x, 7x, -6x**

   **Solution:-**

   In the above questions terms having the same literal factors are like terms.

   Now add the like terms,

   = 5x + 7x + (-6x) ... [∵ + × - = -]

   Add terms having same sign first,

   = 5x + 7x – 6x

   = 12x – 6x

   = 6x

   ii. **(3/5)x, (2/3)x, (-4/5)x**

   **Solution:-**

   In the above questions terms having the same literal factors are like terms.

   = (3/5)x + (2/3)x + (-4/5)x

   LCM of 5, 3, and 5 is 15

   = (9x + 10x – 12x)/ 15

   = (19x – 12x)/ 15

   = (7/15)x

   iii. **$5a^2b$, $-8a^2b$, $7a^2b$**

   **Solution:-**

   In the above questions terms having the same literal factors are like terms.

   Now add the like terms,

   = $5a^2b - 8a^2b + 7a^2b$

   = $12\ a^2b - 8a^2b$

   = $4a^2b$

   iv. **$(3/4)x^2$, $5\ x^2$, $-3x^2$, $-(1/4)\ x^2$**

   **Solution:-**

   In the above questions terms having the same literal factors are like terms.

   Now add the like terms,

   = $(3/4)x^2 + 5x^2 - 3x^2 - (1/4)\ x^2$

   = $(3/4)x^2 - (1/4)\ x^2 + 5x^2 - 3x^2$

   = $((3-1)/4)x^2 + 2x^2$

   = $(2/4)x^2 + 2x^2$

   = $(1/2)x^2 + 2x^2$

   = $((1 + 4)/2)x^2$

   = $(5/2)x^2$

   v. **x – 3y + 4z, y – 2x – 8z, 5x – 2y – 3z**

**Solution:-**

Required sum,

$= (x - 3y + 4z) + (y - 2x - 8z) + (5x - 2y - 3z)$

Collecting like terms,

$= x - 2x + 5x - 3y + y - 2y + 4z - 8z - 3z$

Adding like terms,

$= (1 - 2 + 5)x + (- 3 + 1 - 2)y + (4 - 8 - 3)z$

$= 4x - 4y - 7z$

vi. **$2x^2 - 3y^2, 5x^2 + 6y^2, -3x^2 - 4y^2$**

**Solution:-**

Required sum,

$= (2x^2 - 3y^2) + (5x^2 + 6y^2) + (-3x^2 - 4y^2)$

Collecting like terms,

$= 2x^2 + 5x^2 - 3x^2 - 3y^2 + 6y^2 - 4y^2$

Adding like terms,

$= (2 + 5 - 3)x^2 + (- 3 + 6 - 4)y^2$

$= 4x^2 - y^2$

vii. **$5x - 2x^2 - 8, 8x^2 - 7x - 9, 3 + 7x^2 - 2x$**

**Solution:-**

Required sum,

$= (5x - 2x^2 - 8) + (8x^2 - 7x - 9) + (3 + 7x^2 - 2x)$

Collecting like terms,

$= 2x^2 + 8x^2 + 7x^2 + 5x - 7x - 2x - 8 - 9 + 3$

$= (-2 + 8 + 7)x^2 + (5 - 7 - 2)x + ( - 8 - 9 + 3)$

$= 13x^2 - 4x - 14$

viii. **(2/3)a – (4/5)v + (3/5)c, -(3/4)a – (5/2)b + (2/3)c, (5/2)a + (7/4)b – (5/6)c**

**Solution:-**

Required sum,

= [(2/3)a – (4/5)b + (3/5)c] + [-(3/4)a – (5/2)b + (2/3)c] + [(5/2)a + (7/4)b – (5/6)c]

Collecting like terms,

= (2/3)a -(3/4)a + (5/2)a – (4/5)b – (5/2)b + (7/4)b + (3/5)c + (2/3)c – (5/6)c

= [(2/3) - (3/4) + (5/2)]a + [(-4/5) – (5/2) + (7/4)]b + [(3/5) + (2/3) – (5/6)]c

= [(8 - 9 + 30)/12)a] + [(-16 -15 +30)/20)b] + [(18 + 20 – 25)/ 30)c]

= (29/12)a +- (31/20)b + (13/30)c

ix. **(8/5)x + (11/7)y + (9/4)xy, (-3/2)x – (5/3)y – (9/5)xy**

**Solution:-**

Required sum,

[(8/5)x + (11/7)y + (9/4)xy] + [(-3/2)x – (5/3)y – (9/5)xy]

Collecting like terms,

= [(8/5)x - (3/2)x] + [(11/7)y – (5/3)y] + [(9/4)xy – (9/5)xy]

= (1/10)x – (2/21)y + (9/20)xy

**x. $(3/2)x^3 - (1/4)x^2 + (5/3)$, $(-5/4)x^3 + (3/5)x^2 – x + (1/5)$, $-x^2 + (3/8)x – (8/15)$**

**Solution:-**

Required sum,

= $(3/2)x^3 - (1/4)x^2 + (5/3)$, $(-5/4)x^3 + (3/5)x^2 – x + (1/5)$, $-x^2 + (3/8)x – (8/15)$

Collecting like terms,

= $[(3/2)x^3 - (5/4)x^3] + [- (1/4)x^2 + (3/5)x^2 -x^2] + [– x + (3/8)x] + [(5/3) + (1/5) – (8/15)]$

= $(1/4)x^3 – (13/20)x^2 – (5/8)x + (4/3)$

**2. Subtract :**

**i. -8xy from 7xy**

**Solution:-**

The difference of two like terms is a like term whose coefficient is the difference of the numerical coefficient of the two like terms.

Then,

= (7 – (-8))xy

= 15xy

**ii. $X^2$ from $-3x^2$**

**Solution:-**

The difference of two like terms is a like term whose coefficient is the difference of the numerical coefficient of the two like terms.

Then,

= $(-3 – 1)x^2$

= $-4x^2$

**iii. (x – y) from (4y – 5x)**

**Solution:-**

The difference of two like terms is a like term whose coefficient is the difference of the numerical coefficient of the two like terms.

We have,

= (4y – 5x) – (x – y)

Change the sign of each term of the expression to be subtracted and then add.

= 4y – 5x – x + y

= (-5x – x) + (4y - y)

= -5x + 3y)

= 3y – 5x

**iv. $(a^2 + b^2 – 2ab)$ from $(a^2 + b^2 + 2ab)$**

**Solution:-**

The difference of two like terms is a like term whose coefficient is the difference of the numerical coefficient of the two like terms.

We have,

$= (a^2 + b^2 + 2ab) - (a^2 + b^2 – 2ab)$

Change the sign of each term of the expression to be subtracted and then add.

$= a^2 + b^2 + 2ab – a^2 – b^2 + 2ab$

$= (1 -1)a^2 + (1 – 1)b^2 + (2 + 2)ab$

$= (0)a^2 + (0)b^2 + (4)ab$

$= 4ab$

**v. $(x^2 – y^2)$ from $(2x^2 – 3y^2 + 6xy)$**

**Solution:-**

The difference of two like terms is a like term whose coefficient is the difference of the numerical coefficient of the two like terms.

We have,

$= (2x^2 – 3y^2 + 6xy) - (x^2 – y^2)$

Change the sign of each term of the expression to be subtracted and then add.

$= 2x^2 – 3y^2 + 6xy – x^2 + y^2$

$= (2x^2 - x^2) + (– 3y^2 + y^2) + 6xy$

$= (2 – 1)x^2 + (– 3 + 1)y^2 + 6xy$

$= 1x^2 + (– 2y^2) + 6xy$

$= 1x^2 – 2y^2 + 6xy$

vi. **$(x – y + 3z)$ from $(2z – x - 3y)$**

**Solution:-**

The difference of two like terms is a like term whose coefficient is the difference of the numerical coefficient of the two like terms.

We have,

$= (2z – x - 3y) - (x – y + 3z)$

Change the sign of each term of the expression to be subtracted and then add.

$= 2z – x - 3y – x + y – 3z$

$= (2z – 3z) + (– x – x) + (- 3y + y)$

$= (2 – 3)z + (– 1 – 1)x + (- 3 +1)y$

$= -1z – 2x - 2y$

**3. Subtract $(2a – 3b + 4c)$ from the sum of $(a + 3b – 4c)$, $(4a – b + 9c)$ and $(-2b + 3c – a)$**

**Solution:-**

First we find the sum of $(a + 3b – 4c)$, $(4a – b + 9c)$ and $(-2b + 3c – a)$

$= (a + 3b – 4c) + (4a – b + 9c) + (-2b + 3c – a)$

$= (a + 3b – 4c + 4a – b + 9c - 2b + 3c – a)$

$= (a + 4a – a) + (3b – b – 2b) + (-4c + 9c + 3c)$

= (1 + 4 – 1)a + (3 – 1 – 2)b + (-4 + 9 + 3)c
= 4a + (0)b + 8c
=4a + 8c

Then,
Subtract (2a – 3b + 4c) from (4a + 8c)
= (4a + 8c) - (2a – 3b + 4c)
= 4a + 8c – 2a + 3b – 4c
= (4a – 2a) + (3b) + (8c – 4c)
= 2a + 3b + 4c

## EXERCISE 6B



**Find the products:**

1. **$3a^2 \times 8a^4$**

   **Solution:-**

   The coefficient of the product of two monomials is equal to the product of their coefficients.
   The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
   Then,

   $= (3 \times 8) \times (a^2 \times a^4)$
   $= (24) \times (a^{2+4})$ … [∵ $a^m \times a^n = a^{m+n}$]
   $= (24) \times (a^6)$
   $= 24\ a^{6+}$

2. **$-6x^3 \times 5x^2$**

   **Solution:-**

   The coefficient of the product of two monomials is equal to the product of their coefficients.
   The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
   Then,

   $= (-6 \times 5) \times (x^3 \times x^2)$
   $= (-30) \times (x^{3+2})$ … [∵ $a^m \times a^n = a^{m+n}$]
   $= (-30) \times (x^5)$
   $= -30\ a^5$

3. **$(-4ab) \times (-3a^2bc)$**

   **Solution:-**

   The coefficient of the product of two monomials is equal to the product of their coefficients.
   The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
   Then,

   $= (-4 \times -3) \times (a \times a^2) \times (b \times b) \times c$
   $= (12) \times (a^{1+2}) \times (b^{1+1}) \times c$ … [∵ $a^m \times a^n = a^{m+n}$]
   $= (12) \times (a^3) \times (b^2) \times c$
   $= 12a^3b^2c$

4. **$(2a^2b^3) \times (-3a^3b)$**

   **Solution:-**

   The coefficient of the product of two monomials is equal to the product of their coefficients.
   The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
   Then,

   $= (2 \times -3) \times (a^2 \times a^3) \times (b^3 \times b)$

$= (-6) \times (a^{2+3}) \times (b^{3+1})$ ... [$\because a^m \times a^n = a^{m+n}$]
$= (-6) \times (a^5) \times (b^4)$
$= -6a^5b^4$

**5. $(2/3)x^2y \times (3/5)xy^2$**
**Solution:-**
The coefficient of the product of two monomials is equal to the product of their coefficients.
The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
Then,
$= [(2/3) \times (3/5)] \times (x^2 \times x) \times (y \times y^2)$
$= [(2\times3)/ (3\times5)] \times (x^{2+1}) \times (y^{1+2})$ ... [$\because a^m \times a^n = a^{m+n}$]
$= [(2\times1)/ (1\times5)] \times (x^3) \times (y^3)$
$= [2/5]x^3y^3$

**6. $(-3/4)ab^3 \times (-2/3)a^2b^4$**
**Solution:-**
The coefficient of the product of two monomials is equal to the product of their coefficients.
The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
Then,
$= [(-3/4) \times (-2/3)] \times (a \times a^2) \times (b^3 \times b^4)$
$= [(-3\times-2)/ (4\times3)] \times (a^{1+2}) \times (b^{3+4})$ ... [$\because a^m \times a^n = a^{m+n}$]
$= [(-1\times-1)/ (2\times1)] \times (a^3) \times (b^7)$
$= [1/2]a^3b^7$

**7. $(-1/27)a^2b^2 \times (-9/2)a^3bc^2$**
**Solution:-**
The coefficient of the product of two monomials is equal to the product of their coefficients.
The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
Then,
$= [(-1/27) \times (-9/2)] \times (a^2 \times a^3) \times (b^2 \times b) \times c^2$
$= [(-1\times-9)/ (27\times2)] \times (a^{2+3}) \times (b^{2+1}) \times c^2$ ... [$\because a^m \times a^n = a^{m+n}$]
$= [(-1\times-1)/ (3\times2)] \times (a^5) \times (b^3) \times c^2$
$= [1/6]a^5b^3c^2$

**8. $(-13/5)ab^2c \times (7/3)a^2bc^2$**
**Solution:-**
The coefficient of the product of two monomials is equal to the product of their coefficients.
The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
Then,
$= [(-13/5) \times (7/3)] \times (a \times a^2) \times (b^2 \times b) \times (c \times c^2)$

$= [(-13\times7)/ (5\times3)] \times (a^{1+2}) \times (b^{2+1}) \times (c^{1+2})$ … [∵ $a^m \times a^n = a^{m+n}$]
$= [-91/ 15] \times (a^3) \times (b^3) \times c^3$
$= [-91/15]a^3b^3c^3$

**9. $(-18/5)x^2z \times (-25/6)xz^2y$**
**Solution:-**
The coefficient of the product of two monomials is equal to the product of their coefficients.
The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
Then,
$= [(-18/5) \times (-25/6)] \times (x^2 \times x) \times (z \times z^2) \times (y)$
$= [(-18\times-25)/ (5\times6)] \times (x^{2+1}) \times (z^{1+2}) \times (y)$ … [∵ $a^m \times a^n = a^{m+n}$]
$= [(-3\times-5)/ (1\times1)] \times (x^3) \times (z^3) \times y$
$= 15x^3z^3y$

**10. $(-3/14)xy^4 \times (7/6)x^3y$**
**Solution:-**
The coefficient of the product of two monomials is equal to the product of their coefficients.
The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
Then,
$= [(-3/14) \times (7/6)] \times (x \times x^3) \times (y^4 \times y)$
$= [(-3\times7)/ (14\times6)] \times (x^{1+3}) \times (y^{4+1})$ … [∵ $a^m \times a^n = a^{m+n}$]
$= [(-1\times1)/ (2\times2)] \times (x^4) \times (y^5)$
$= (-1/4)x^4y^5$

**11. $(-7/5)x^2y \times (3/2)xy^2 \times (-6/5)x^3y^3$**
**Solution:-**
The coefficient of the product of two monomials is equal to the product of their coefficients.
The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
Then,
$= [(-7/5) \times (3/2) \times (-6/5)] \times (x^2 \times x \times x^3) \times (y \times y^2 \times y^3)$
$= [(-7\times3\times-6)/ (5\times2\times5)] \times (x^{2+1+3}) \times (y^{1+2+3})$ … [∵ $a^m \times a^n = a^{m+n}$]
$= [(-7\times3\times-2)/ (5\times1\times5)] \times (x^6) \times (y^6)$
$= (63/25)x^6y^6$

**12. $2a^2b \times (-5)ab^2c \times (-6)bc^2$**
**Solution:-**
The coefficient of the product of two monomials is equal to the product of their coefficients.
The variable part in the product of two monomials is equal to the product of the variables in the given monomials.
Then,
$= [(2) \times (-5) \times (-6)] \times (a^2 \times a) \times (b \times b^2 \times b) \times (c \times c^2)$

$= [60] \times (a^{2+1}) \times (b^{1+2+1}) \times (c^{1+2})$ ... [$\because a^m \times a^n = a^{m+n}$]

$= [60] \times (a^3) \times (b^4) \times (c^3)$

$= [60]a^3b^4c^3$

## EXERCISE 6C 

**Find each of the following products:**

1. **4a(3a + 7b)**
   **Solution**:-
   Let p, q and r be three monomials.
   Then, by distributive law of multiplication over addition, we have:
   P × (q + r) = (p × q) + (p × r)
   Now,
   = (4a × 3a) + (4a × 7b)
   = $(12a^2 + 28ab)$ … [∵ $a^m \times a^n = a^{m+n}$]

2. **5a(6a - 3b)**
   **Solution**:-
   Let p, q and r be three monomials.
   Then, by distributive law of multiplication over subtraction, we have:
   P × (q - r) = (p × q) - (p × r)
   Now,
   = (5a × 6a) - (5a × 3b)
   = $(30a^2 - 15ab)$ … [∵ $a^m \times a^n = a^{m+n}$]

3. **$8a^2(2a + 5b)$**
   **Solution**:-
   Let p, q and r be three monomials.
   Then, by distributive law of multiplication over addition, we have:
   P × (q + r) = (p × q) + (p × r)
   Now,
   = $(8a^2 \times 2a) + (8a^2 \times 5b)$
   = $(16a^3 + 40a^2b)$ … [∵ $a^m \times a^n = a^{m+n}$]

4. **$9x^2(5x + 7)$**
   **Solution**:-
   Let p, q and r be three monomials.
   Then, by distributive law of multiplication over addition, we have:
   P × (q + r) = (p × q) + (p × r)
   Now,
   = $(9x^2 \times 5x) + (9x^2 \times 7)$
   = $(45x^3 + 63x^2)$ … [∵ $a^m \times a^n = a^{m+n}$]

5. **$ab(a^2 – b^2)$**
   **Solution**:-
   Let p, q and r be three monomials.
   Then, by distributive law of multiplication over subtraction, we have:

P × (q - r) = (p × q) - (p × r)
Now,
= (ab × $a^2$) - (ab × $b^2$)
= ($a^3b$ + $ab^3$) ... [∵ $a^m \times a^n = a^{m+n}$]

**6. $2x^2(3x - 4x^2)$**
**Solution**:-
Let p, q and r be three monomials.
Then, by distributive law of multiplication over subtraction, we have:
P × (q - r) = (p × q) - (p × r)
Now,
= ($2x^2$ × 3x) - ($2x^2$ × $4x^2$)
= ($6x^3 - 8x^4$) ... [∵ $a^m \times a^n = a^{m+n}$]

**7. $(3/5)m^2n(m + 5n)$**
**Solution**:-
Let p, q and r be three monomials.
Then, by distributive law of multiplication over addition, we have:
P × (q + r) = (p × q) + (p × r)
Now,
= ((3/5)$m^2n$ × m) + ((3/5)$m^2n$ × 5n)
= ((3/5)$m^3n$ + $3m^2n^2$) ... [∵ $a^m \times a^n = a^{m+n}$]

**8. $-17x^2(3x - 4)$**
**Solution**:-
Let p, q and r be three monomials.
Then, by distributive law of multiplication over subtraction, we have:
P × (q - r) = (p × q) - (p × r)
Now,
= ($-17x^2$ × 3x) - ($-17x^2$ × 4)
= ($-51x^3 + 68x^2$) ... [∵ $a^m \times a^n = a^{m+n}$]

**9. $(7/2)x^2((4/7)x + 2)$**
**Solution**:-
Let p, q and r be three monomials.
Then, by distributive law of multiplication over addition, we have:
P × (q + r) = (p × q) + (p × r)
Now,
= ((7/2)$x^2$ × (4/7)x) + ((7/2)$x^2$ × 2)
= ((7×4)/ (2×7))$x^3$ + ((7×2)/(2×1))$x^2$ ... [∵ $a^m \times a^n = a^{m+n}$]
= ((1×2)/ (1×1))$x^3$ + ((7×1)/(1×1))$x^2$
= (2)$x^3$ + (7)$x^2$

**10. $-4x^2y(3x^2 - 5y)$**

**Solution**:-
Let p, q and r be three monomials.
Then, by distributive law of multiplication over subtraction, we have:
P × (q - r) = (p × q) - (p × r)
Now,
= $(-4x^2y \times 3x^2) - (-4x^2y \times -5y)$
= $(-12x^4y + 20x^2y^2)$ … [∵ $a^m \times a^n = a^{m+n}$]

**11. $(-4/27)xyz((9/2)x^2yz - (3/4)xyz^2)$**
**Solution**:-
Let p, q and r be three monomials.
Then, by distributive law of multiplication over subtraction, we have:
P × (q - r) = (p × q) - (p × r)
Now,
= $((-4/27)xyz \times (9/2)x^2yz) - ((-4/27)xyz \times (-3/4)xyz^2)$
= $((-4\times9)/(27\times2))x^3y^2z^2 + ((-4\times-3)/(27\times4))x^2y^2z^3$ … [∵ $a^m \times a^n = a^{m+n}$]
= $((-2\times1)/(3\times1))x^3y^2z^2 + ((-1\times-1)/(9\times1))x^2y^2z^3$
= $(-2/3)x^3y^2z^2 + (1/9)x^2y^2z^3$

**12. $9t^2(t + 7t^3)$**
**Solution**:-
Let p, q and r be three monomials.
Then, by distributive law of multiplication over addition, we have:
P × (q + r) = (p × q) + (p × r)
Now,
= $(9t^2 \times t) + (9t^2 \times 7t^3)$
= $(9t^3 + 63t^5)$ … [∵ $a^m \times a^n = a^{m+n}$]

**13. $10a^2(0.1a - 0.5b)$**
**Solution**:-
Let p, q and r be three monomials.
Then, by distributive law of multiplication over subtraction, we have:
P × (q - r) = (p × q) - (p × r)
Now,
= $(10a^2 \times 0.1a) - (10a^2 \times 0.5b)$
= $(1a^3 - 5a^2b)$ … [∵ $a^m \times a^n = a^{m+n}$]

## EXERCISE 6D PAGE: 106

**Find each of the following products:**

1. **(5x + 7) (3x + 4)**
   **Solution:-**
   Suppose (a + b) and (c + d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.
   (a + b) × (c + d) = a × (c + d) + b × (c + d) = (a × c + a × d) + (b × c + b × d)
   = ac + ad + bc + bd
   Let,
   a= 5x, b= 7, c= 3x, d= 4
   Now,
   = 5x × (3x + 4) +7 × (3x + 4)
   = [(5x × 3x) + (5x × 4)] + [(7 × 3x) + (7 × 4)]
   = [$15x^2$ + 20x + 21x + 28]
   = [$15x^2$ + 41x + 28]

2. **(4x - 3) (2x + 5)**
   **Solution:-**
   Suppose (a - b) and (c + d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.
   (a - b) × (c + d) = a × (c + d) - b × (c + d) = (a × c + a × d) - (b × c + b × d)
   = ac + ad - bc - bd
   Let,
   a= 4x, b= 3, c= 2x, d= 5
   Now,
   = 4x × (2x + 5) -3 × (2x + 5)
   = [(4x × 2x) + (4x × 5)] - [(3 × 2x) + (3 × 5)]
   = [$8x^2$ + 20x - 6x - 15]
   = [$8x^2$ + 14x - 15]

3. **(x - 6) (4x + 9)**
   **Solution:-**
   Suppose (a - b) and (c + d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.
   (a - b) × (c + d) = a × (c + d) - b × (c + d) = (a × c + a × d) - (b × c + b × d)
   = ac + ad - bc - bd
   Let,
   a= x, b= 6, c= 24x, d= 9
   Now,
   = x × (4x + 9) -6 × (4x + 5)
   = [(x × 4x) + (x × 9)] - [(6 × 4x) + (6 × 9)]
   = [$4x^2$ + 9x - 24x - 54]

= [$4x^2$ - 15x - 54]

4. **(5y - 1) (3y - 8)**
**Solution:-**
Suppose (a - b) and (c - d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.
(a - b) × (c - d) = a × (c - d) - b × (c - d) = (a × c - a × d) - (b × c - b × d)
= ac - ad - bc + bd
Let,
a= 5y, b= 1, c= 3y, d= 8
Now,
= 5y × (3y - 8) -1 × (3y - 8)
= [(5y × 3y) + (5y × -8)] - [(1 × 3y) + (1 × -8)]
= [$15y^2$ – 40y – 3y + 8]
= [$15y^2$ – 43y + 8]

5. **(7x + 2y) (x + 4y)**
**Solution:-**
Suppose (a + b) and (c + d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.
(a + b) × (c + d) = a × (c + d) + b × (c + d) = (a × c + a × d) + (b × c + b × d)
= ac + ad + bc + bd
Let,
a= 7x, b= 2y, c= x, d= 4y
Now,
= 7x × (x + 4y) +2y × (x + 4y)
= [(7x × x) + (7x × 4y)] + [(2y × x) + (2y × 4y)]
= [$7x^2$ + 28xy + 2yx + $8y^2$]
= [$7x^2$ + 30xy + $8y^2$]

6. **(9x + 5y) (4x + 3y)**
**Solution:-**
Suppose (a + b) and (c + d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.
(a + b) × (c + d) = a × (c + d) + b × (c + d) = (a × c + a × d) + (b × c + b × d)
= ac + ad + bc + bd
Let,
a= 9x, b= 5y, c= 4x, d= 3y
Now,
= 9x × (4x + 3y) +5y × (4x + 3y)
= [(9x × 4x) + (9x × 3y)] + [(5y × 4x) + (5y × 3y)]
= [$36x^2$ + 27xy + 20yx + $15y^2$]
= [$36x^2$ + 47xy + $15y^2$]

**7. (3m – 4n) (2m – 3n)**

**Solution:-**

Suppose (a - b) and (c - d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a - b) × (c - d) = a × (c - d) - b × (c - d) = (a × c - a × d) - (b × c - b × d)

= ac - ad - bc + bd

Let,

a= 3m, b= 4n, c= 2m, d= 3n

Now,

= 3m × (2m – 3n) -4n × (2m – 3n)

= [(3m × 2m) + (3m × -3n)] - [(4n × 2m) + (4n × -3n)]

= [$6m^2$ – 9mn – 8mn + $12n^2$]

= [$6m^2$ – 17mn + $12n^2$]

**8. (0.8x – 0.5y) (1.5x – 3y)**

**Solution:-**

Suppose (a - b) and (c - d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a - b) × (c - d) = a × (c - d) - b × (c - d) = (a × c - a × d) - (b × c - b × d)

= ac - ad - bc + bd

Let,

a= 0.8x, b= 0.5y, c= 1.5x, d= 3y

Now,

= 0.8x × (1.5x – 3y) - 0.5y × (1.5x – 3y)

= [(0.8x × 1.5x) + (0.8x × -3y)] - [(0.5y × 1.5x) + (0.5y × -3y)]

= [$1.2x^2$ – 2.4xy – 0.75yx + $1.5y^2$]

= [$1.2x^2$ – 3.15xy + $1.5y^2$]

**9. ((1/5)x + 2y) ((2/3)x – y)**

**Solution:-**

Suppose (a + b) and (c - d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a + b) × (c - d) = a × (c - d) + b × (c - d) = (a × c - a × d) + (b × c - b × d)

= ac - ad + bc - bd

Let,

a= (1/5)x, b= 2y, c= (2/3)x, d= y

Now,

= (1/5)x × ((2/3)x – y) + 2y × ((2/3)x – y)

= [((1/5)x × (2/3)x) + ((1/5)x × -y)] + [(2y × (2/3)x) + (2y × -y)]

= [(2/15)$x^2$ - (1/5)xy + (4/3)yx - $2y^2$)]

= [(2/15)$x^2$ + (17/15) xy - $2y^2$]

**10. ((2/5)x – (1/2)y) (10x – 8y)**

**Solution:-**

Suppose (a - b) and (c - d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a - b) × (c - d) = a × (c - d) - b × (c - d) = (a × c - a × d) - (b × c - b × d)

= ac - ad - bc + bd

Let,

a= (2/5)x, b=(1/2)y, c= 10x, d= 8y

Now,

= (2/5)x × (10x – 8y) - (1/2)y × (10x – 8y)

= [((2/5)x × 10x) + ((2/5)x × -8y)] - [((1/2)y × 10x) + ((1/2)y × -8y)]

= $[4x^2 – (16/5)xy – 5yx + 4y^2]$

= $[4x^2 – (41/5)xy + 4y^2]$

**11. ((3/4)a + (2/3)b) (4a + 3b)**

**Solution:-**

Suppose (a - b) and (c - d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a + b) × (c + d) = a × (c + d) + b × (c + d) = (a × c + a × d) + (b × c + b × d)

= ac + ad + bc + bd

Let,

a= (3/4)a, b=(2/3)b, c= 4a, d= 3b

Now,

= (3/4)a × (4a + 3b) + (2/3)b × (4a + 3b)

= [((3/4)a × 4a) + ((3/4)a + 3b)] - [((2/3)b × 4a) + ((2/3)b × + 3b)]

= $[3a^2 + (9/4)ab + (8/3)ab + 2b^2]$

= $[3a^2 + ((27+32)/12)ab + 2b^2]$

= $[3a^2 + (59/12)ab + 2b^2]$

**12. $(x^2 – a^2)$ (x – a)**

**Solution:-**

Suppose (a - b) and (c - d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a - b) × (c - d) = a × (c - d) - b × (c - d) = (a × c - a × d) - (b × c - b × d)

= ac - ad - bc + bd

Let,

a= $x^2$, b= $a^2$, c= x, d= a

Now,

= $x^2 × (x – a) - a^2 × (x – a)$

= $[(x^2 × x) + (x^2 × -a)] - [(a^2 × x) + (a^2 × -a)]$

= $[x^3 – x^2a – a^2x + a^3]$

**13. $(3p^2 + q^2)$ $(2p^2 – 3q^2)$**

**Solution:-**

Suppose (a + b) and (c - d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a + b) × (c - d) = a × (c - d) + b × (c - d) = (a × c - a × d) + (b × c - b × d)

= ac - ad + bc - bd

Let,

$a= 3p^2$, $b= q^2$, $c= 2p^2$, $d= 3q^2$

Now,

$= 3p^2 \times (2p^2 – 3q^2) + q^2 \times (2p^2 – 3q^2)$

$= [(3p^2 \times 2p^2) + (3p^2 \times -3q^2)] + [(q^2 \times 2p^2) + (q^2 \times -3q^2)]$

$= [6p^4 – 9p^2q^2 + 2q^2p^2 – 3q^4)]$

$= [6p^4 – 7p^2q^2 – 3q^4]$

**14. $(2x^2 – 5y^2) (x^2 + 3y^2)$**

**Solution:-**

Suppose (a - b) and (c + d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a - b) × (c + d) = a × (c + d) - b × (c + d) = (a × c + a × d) - (b × c + b × d)

= ac + ad - bc - bd

Let,

$a= 2x^2$, $b= 5y^2$, $c= x^2$, $d= 3y^2$

Now,

$= 2x^2 \times (x^2 + 3y^2) – 5y^2 \times (x^2 + 3y^2)$

$= [(2x^2 \times x^2) + (2x^2 \times 3y^2)] - [(5y^2 \times x^2) + (5y^2 \times 3y^2)]$

$= [2x^4 + 6x^2y^2 – 5y^2x^2 – 15y^4]$

$= [2x^4 + x^2y^2 – 15y^4]$

**15. $(x^3 – y^3) (x^2 + y^2)$**

**Solution:-**

Suppose (a - b) and (c + d) are two binomials. By using the distributive law of multiplication over addition twice, we may find their product as given below.

(a - b) × (c + d) = a × (c + d) - b × (c + d) = (a × c + a × d) - (b × c + b × d)

= ac + ad - bc - bd

Let,

$a= x^3$, $b= y^3$, $c= x^2$, $d= y^2$

Now,

$= x^3 \times (x^2 + y^2) – y^3 \times (x^2 + y^2)$

$= [(x^3 \times x^2) + (x^3 \times y^2)] - [(y^3 \times x^2) + (y^3 \times y^2)]$

$= [x^5 + x^3y^2 – y^3x^2 – y^5]$