EXERCISE 6.5   **PAGE NO: 6.30**

Multiply:
1. (5x + 3) by (7x + 2)
Solution:
Now let us simplify the given expression
(5x + 3) × (7x + 2)
5x (7x + 2) + 3 (7x + 2)
$35x^2$ + 10x + 21x + 6
$35x^2$ + 31x + 6

2. (2x + 8) by (x - 3)
Solution:
Now let us simplify the given expression
(2x + 8) × (x − 3)
2x (x − 3) + 8 (x − 3)
$2x^2$ − 6x + 8x − 24
$2x^2$ + 2x - 24

3. (7x + y) by (x + 5y)
Solution:
Now let us simplify the given expression
(7x + y) × (x + 5y)
7x (x + 5y) + y (x + 5y)
$7x^2$ + 35xy + xy + $5y^2$
$7x^2$ + 36xy + $5y^2$

4. (a - 1) by (0.1a^2 + 3)
Solution:
Now let us simplify the given expression
(a - 1) × (0.1a^2 + 3)
a (0.1a^2 + 3) -1 (0.1a^2 + 3)
0.1a^3 + 3a – 0.1a^2 – 3
0.1a^3 – 0.1a^2 + 3a – 3

5. (3x^2 + y^2) by (2x^2 + 3y^2)
Solution:
Now let us simplify the given expression
(3x^2 + y^2) × (2x^2 + 3 y^2)

$3x^2 \times (2x^2 + 3y^2) + y^2 \times (2x^2 + 3y^2)$
$6x^4 + 9x^2y^2 + 2x^2y^2 + 3y^4$
$6x^4 + 11x^2y^2 + 3y^4$

6. (3/5x + 1/2y) by (5/6x + 4y)
Solution:
Now let us simplify the given expression
$(3/5x + 1/2y) \times (5/6x + 4y)$
$3/5x \times (5/6x + 4y) + 1/2y \times (5/6x + 4y)$
$15/30x^2 + 12/5xy + 5/12xy + 4/2y^2$
$1/2x^2 + 169/60xy + 2y^2$

7. ($x^6 - y^6$) by ($x^2 + y^2$)
Solution:
Now let us simplify the given expression
$(x^6 - y^6) \times (x^2 + y^2)$
$x^6 \times (x^2 + y^2) - y^6 \times (x^2 + y^2)$
$x^8 + x^6y^2 - x^2y^6 - y^8$

8. ($x^2 + y^2$) by (3a + 2b)
Solution:
Now let us simplify the given expression
$(x^2 + y^2) \times (3a + 2b)$
$x^2 \times (3a + 2b) + y^2 \times (3a + 2b)$
$3ax^2 + 3ay^2 + 2bx^2 + 2by^2$

9. (- 3d - 7f) by (5d + f)
Solution:
Now let us simplify the given expression
$(- 3d - 7f) \times (5d + f)$
$-3d (5d + f) - 7f (5d + f)$
$- 15d^2 - 3df - 35df - 7f^2$
$- 15d^2 - 38df - 7f^2$

10. (0.8a – o.5b) by (1.5a – 3b)
Solution:
Now let us simplify the given expression
$(0.8a - 0.5b) \times (1.5a - 3b)$
$0.8a (1.5a - 3b) - 0.5b (1.5a - 3b)$

$1.2a^2 – 2.4ab – 0.75ab + 1.5b^2$
$1.2a^2 – 3.15ab + 1.5b^2$

11. $(2x^2y^2 – 5xy^2)$ by $(x^2 – y^2)$
Solution:
Now let us simplify the given expression
$(2x^2y^2 – 5xy^2) \times (x^2 – y^2)$
$2x^2y^2 (x^2 – y^2) – 5xy^2 (x^2 – y^2)$
$2x^4y^2 – 5x^3y^2 – 2x^2y^4 + 5xy^4$

12. $(x/7 + x^2/2)$ by $(2/5 + 9x/4)$
Solution:
Now let us simplify the given expression
$(x/7 + x^2/2) \times (2/5 + 9x/4)$
$x/7 (2/5 + 9x/4) + x^2/2 (2/5 + 9x/4)$
$2x/35 + (9 x^2)/28 + x^2/5 + (9 x^3)/8$
$9/8x^3 + 73/140x^2 + 2/35x$

13. $(-a/7 + a^2/9)$ by $(b/2 – b^2/3)$
Solution:
Now let us simplify the given expression
$(-a/7 + a^2/9) \times (b/2 – b^2/3)$
$-a/7 (b/2 – b^2/3) + a^2/9 (b/2 – b^2/3)$
$-ab/14 + ab^2/21 + a^2b/18 – a^2b^2/27$

14. $(3x^2y – 5xy^2)$ by $(1/5x^2 + 1/3y^2)$
Solution:
Now let us simplify the given expression
$(3x^2y – 5xy^2) \times (1/5x^2 + 1/3y^2)$
$3x^2y (1/5x^2 + 1/3y^2) – 5xy^2 (1/5x^2 + 1/3y^2)$
$3/5x^4y + 3/3x^2y^3 – x^3y^2 + 5/3xy^4$
$3/5x^4y + x^2y^3 – x^3y^2 + 5/3xy^4$

15. $(2x^2 – 1)$ by $(4x^3 + 5x^2)$
Solution:
Now let us simplify the given expression
$(2x^2 – 1) \times (4x^3 + 5x^2)$
$2x^2 (4x^3 + 5x^2) – 1 (4x^3 + 5x^2)$
$8x^5 + 10x^4 – 4x^3 – 5x^2$

16. $(2xy + 3y^2)$ by $(3y^2 – 2)$
Solution:
Now let us simplify the given expression
$(2xy + 3y^2) \times (3y^2 – 2)$
$2xy (3y^2 – 2) + 3y^2 (3y^2 – 2)$
$6xy^3 – 4xy + 9y^4 – 6y^2$

Find the following products and verify the results for x = -1, y = -2:
17. $(3x – 5y) (x + y)$
Solution:
Now let us simplify the given expression
$(3x – 5y) \times (x + y)$
$(3x – 5y) \times (x + y)$
$x (3x – 5y) + y (3x – 5y)$
$3x^2 – 5xy + 3xy – 5y^2$
$3x^2 – 2xy – 5y^2$
Let us substitute the given values x = - 1 and y = - 2, then
$(3x – 5y) \times (x + y)$
$[3 (-1) – 5 (-2)] \times [(-1) + (-2)]$
$(-3+10) \times (-1-2)$
7×-3
-21

$3x^2 – 2xy – 5y^2$
$3 (-1)^2 – 2 (-1) (-2) – 5 (-2)^2$
$3 – 4 – 20$
$- 21$
∴ the given expression is verified.

18. $(x^2y - 1) (3 – 2x^2y)$
Solution:
Now let us simplify the given expression
$(x^2y - 1) \times (3 – 2x^2y)$
$x^2y (3 – 2x^2y) – 1 (3 – 2x^2y)$
$3x^2y - 2x^4y^2 – 3 + 2x^2y$
$5x^2y - 2x^4y^2 – 3$
Let us substitute the given values x = - 1 and y = - 2, then
$(x^2y - 1) \times (3 – 2x^2y)$
$[(-1)^2 (-2) – 1] \times [3 – 2 (-1)^2 (-2)$

$(-2 – 1) \times (3 + 4)$
-3×7
-21

$5x^2y - 2x^4y^2 – 3$
$[-2 (-1)^4 (-2)^2 + 5 (-1)^2 (2) – 3]$
$- 8 – 10 – 3$
-21
∴ the given expression is verified.

19. $(1/3x – y^2/5) (1/3x + y^2/5)$
Solution:
Now let us simplify the given expression
$(1/3x – y^2/5) \times (1/3x + y^2/5)$
$(1/3x)^2 – (y^2/5)^2$
$(1/3x – y^2/5) (1/3x + y^2/5)$
$1/9x^2 – 1/25y^4$
Let us substitute the given values x = - 1 and y = - 2, then
$(1/3x – y^2/5) \times (1/3x + y^2/5)$
$(1/3(-1) – (-2)^2/5) \times (1/3(-1) + (-2)^2/5)$
$(-17/15) \times (7/15)$
$-119/225$

$1/9x^2 – 1/25y^4$
$1/9 (-1)^2 – 1/25 (-2)^4$
$1/9 -16/25$
$-119/225$
∴ the given expression is verified.

Simplify:
20. $x^2 (x + 2y) (x – 3y)$
Solution:
Now let us simplify the given expression
$x^2 (x + 2y) (x – 3y)$
$x^2 (x^2 – 3xy + 2xy – 3y^2)$
$x^2 (x^2 – xy – 6y^2)$
$x^4 – x^3y – 6x^2y^2$

21. $(x^2 - 2y^2) (x + 4y)x^2y^2$

Solution:
Now let us simplify the given expression
$(x^2 - 2y^2) (x + 4y)x^2y^2$
$(x^3 + 4x^2y - 2xy^2 - 8y^3) \times x^2y^2$
$x^5y^2 + 4x^4y^3 - 2x^3y^4 - 8x^2y^5$

22. $a^2b^2 (a + 2b) (3a + b)$
Solution:
Now let us simplify the given expression
$a^2b^2 (a + 2b) (3a + b)$
$a^2b^2 (3a^2 + ab + 6ab + 2b^2)$
$a^2b^2 (3a^2 + 7ab + 2b^2)$
$3a^4b^2 + 7a^3b^3 + 2a^2b^4$

23. $x^2 (x - y) y^2 (x + 2y)$
Solution:
Now let us simplify the given expression
$x^2 (x - y) y^2 (x + 2y)$
$x^2y^2 (x^2 + 2xy - xy - 2y^2)$
$x^2y^2 (x^2 + xy - 2y^2)$
$x^4y^2 + x^3y^3 - 2x^2y^4$

24. $(x^3 - 2x^2 + 5x - 7) (2x - 3)$
Solution:
Now let us simplify the given expression
$(x^3 - 2x^2 + 5x - 7) (2x - 3)$
$2x^4 - 4x^3 + 10x^2 - 14x - 3x^3 + 6x^2 - 15x + 21$
$2x^4 - 7x^3 + 16x^2 - 29x + 21$

25. $(5x + 3) (x - 1) (3x - 2)$
Solution:
Now let us simplify the given expression
$(5x + 3) (x - 1) (3x - 2)$
$(5x^2 - 2x - 3) (3x - 2)$
$15x^3 - 6x^2 - 9x - 10x^2 + 4x + 6$
$15x^3 - 16x^2 - 5x + 6$

26. $(5 - x) (6 - 5x) (2 - x)$
Solution:

Now let us simplify the given expression
(5 - x) (6 – 5x) (2 - x)
$(x^2 – 7x + 10) (6 – 5x)$
$-5x^3 + 35x^2 – 50x + 6x^2 – 42x + 60$
$60 – 92x + 41x^2 - 5x^3$

27. $(2x^2 + 3x - 5) (3x^2 - 5x + 4)$
Solution:
Now let us simplify the given expression
$(2x^2 + 3x - 5) (3x^2 - 5x + 4)$
$6x^4 + 9x^3 – 15x^2 – 10x^3 – 15x^2 + 25x + 8x^2 + 12x – 20$
$6x^4 – x^3 – 22x^2 + 37x - 20$

28. (3x - 2) (2x - 3) + (5x - 3) (x + 1)
Solution:
Now let us simplify the given expression
(3x - 2) (2x - 3) + (5x - 3) (x + 1)
$6x^2 – 9x – 4x + 6 + 5x^2 + 5x – 3x – 3$
$11x^2 – 11x + 3$

29. (5x - 3) (x + 2) - (2x + 5) (4x - 3)
Solution:
Now let us simplify the given expression
(5x - 3) (x + 2) - (2x + 5) (4x - 3)
$5x^2 + 10x – 3x – 6 – 8x^2 + 6x – 20x + 15$
$-3x^2 – 7x + 9$

30. (3x + 2y) (4x + 3y) - (2x - y) (7x – 3y)
Solution:
Now let us simplify the given expression
(3x + 2y) (4x + 3y) - (2x - y) (7x – 3y)
$12x^2 + 9xy + 8xy$
$12x^2 + 9xy + 8xy + 6y^2 – 14x^2 + 6xy + 7xy – 3y^2$
$-2x^2 + 3y^2 + 30xy$

31. $(x^2 - 3x + 2) (5x - 2) - (3x^2 + 4x - 5) (2x – 1)$
Solution:
Now let us simplify the given expression
$(x^2 - 3x + 2) (5x - 2) - (3x^2 + 4x - 5) (2x – 1)$

$5x^3 - 15x^2 + 10x - 2x^2 + 6x - 4 - (6x^3 + 8x^2 - 10x - 3x^2 - 4x + 5)$
$5x^3 - 6x^3 - 15x^2 - 2x^2 - 5x^2 + 16x + 14x - 4 - 5$
$- x^3 - 22x^2 + 30x - 9$

32. $(x^3 - 2x^2 + 3x - 4) (x - 1) - (2x - 3) (x^2 - x + 1)$
Solution:
Now let us simplify the given expression
$(x^3 - 2x^2 + 3x - 4) (x - 1) - (2x - 3) (x^2 - x + 1)$
$x^4 - 2x^3 + 3x^2 - 4x - x^3 + 2x^2 - 3x + 4 - (2x^3 - 2x^2 + 2x - 3x^2 + 3x - 3)$
$x^4 - 3x^3 + 5x^2 - 7x + 4 - 2x^3 + 5x^2 - 5x + 3$
$x^4 - 5x^3 + 10x^2 - 12x + 7$