EXERCISE 7.3 PAGE NO: 7.7

Factorize each of the following algebraic expressions:

1. 6x (2x - y) + 7y (2x - y)

Solution:

We have,

6x (2x - y) + 7y (2x - y)

By taking (2x – y) as common we get,

(6x + 7y) (2x – y)

2. 2r (y - x) + s (x - y)

Solution:

We have,

2r (y - x) + s (x - y)

By taking (-1) as common we get,

-2r (x – y) + s (x – y)

By taking (x - y) as common we get,

(x – y) (-2r + s)

(x – y) (s – 2r)

3. 7a (2x - 3) + 3b (2x - 3)

Solution:

We have,

7a (2x - 3) + 3b (2x - 3)

By taking (2x - 3) as common we get,

(7a + 3b) (2x – 3)

4. 9a (6a – 5b) – 12a^2 (6a – 5b)

Solution:

We have,

9a (6a – 5b) – 12a^2 (6a – 5b)

By taking (6a – 5b) as common we get,

(9a – 12a^2) (6a – 5b)

3a(3 – 4a) (6a – 5b)

5. 5 (x – 2y)^2 + 3 (x – 2y)

Solution:

We have,

5 (x – 2y)^2 + 3 (x – 2y)

By taking (x – 2y) as common we get,
(x – 2y) [5 (x – 2y) + 3]
(x – 2y) (5x – 10y + 3)

6. $16 (2l – 3m)^2 - 12 (3m – 2l)$
Solution:
We have,
$16 (2l – 3m)^2 - 12 (3m – 2l)$
By taking (-1) as common we get,
$16 (2l – 3m)^2 + 12 (2l – 3m)$
By taking 4(2l – 3m) as common we get,
4(2l – 3m) [4 (2l – 3m) + 3]
4(2l – 3m) (8l – 12m + 3)

7. 3a (x – 2y) – b (x – 2y)
Solution:
We have,
3a (x – 2y) – b (x – 2y)
By taking (x – 2y) as common we get,
(3a – b) (x – 2y)

8. $a^2 (x + y) + b^2 (x + y) + c^2 (x + y)$
Solution:
We have,
$a^2 (x + y) + b^2 (x + y) + c^2 (x + y)$
By taking (x + y) as common we get,
$(a^2 + b^2 + c^2) (x + y)$

9. $(x - y)^2 + (x - y)$
Solution:
We have,
$(x - y)^2 + (x - y)$
By taking (x - y) as common we get,
(x – y) (x – y + 1)

10. $6 (a + 2b) – 4 (a + 2b)^2$
Solution:
We have,
$6 (a + 2b) – 4 (a + 2b)^2$

By taking (a + 2b) as common we get,
[6 – 4 (a + 2b)] (a + 2b)
(6 – 4a – 8b) (a + 2b)
2(3 – 2a – 4b) (a + 2b)

11. a (x - y) + 2b (y - x) + c $(x – y)^2$
Solution:
We have,
a (x - y) + 2b (y - x) + c $(x – y)^2$
By taking (-1) as common we get,
a (x - y) - 2b (x - y) + c $(x – y)^2$
By taking (x - y) as common we get,
[a – 2b + c(x - y)] (x - y)
(x - y) (a – 2b + cx - cy)

12. -4 $(x – 2y)^2$ + 8 (x – 2y)
Solution:
We have,
-4 $(x – 2y)^2$ + 8 (x – 2y)
By taking 4(x - 2y) as common we get,
[-(x – 2y) + 2] 4(x - 2y)
4(x - 2y) (-x + 2y + 2)

13. x^3 (a – 2b) + x^2 (a – 2b)
Solution:
We have,
x^3 (a – 2b) + x^2 (a – 2b)
By taking x^2 (a – 2b) as common we get,
(x + 1) [x^2 (a – 2b)]
x^2 (a – 2b) (x + 1)

14. (2x – 3y) (a + b) + (3x – 2y) (a + b)
Solution:
We have,
(2x – 3y) (a + b) + (3x – 2y) (a + b)
By taking (a + b) as common we get,
(a + b) [(2x – 3y) + (3x – 2y)]
(a + b) [2x -3y + 3x – 2y]
(a + b) [5x – 5y]

(a + b) 5(x - y)

15. 4(x + y) (3a - b) + 6(x + y) (2b – 3a)
Solution:
We have,
4(x + y) (3a - b) + 6(x + y) (2b – 3a)
By taking (x + y) as common we get,
(x + y) [4(3a - b) + 6(2b – 3a)]
(x + y) [12a – 4b + 12b – 18a]
(x + y) [-6a + 8b]
(x + y) 2(-3a + 4b)
(x + y) 2(4b – 3a)