MATHS

BOOKS - ICSE

FACTORISATION

3 Mark Questions

1. Factorise by taking at the common factors:

(i)

$$ab(a^2 + b^2 - c^2) - bc(c^2 - a^2 - b^2) + ca(a^2 + b^2 - c^2)$$

(ii) $2x(a - b) + 3y(5a - 5b) + 4z(2b - 2a)$

2. Factorise : $\left(x^2 - 3x\right)\left(x^2 - 3x - 1\right) - 20$

3. Give possible experssions for the length and the breadth of the rectangular whose area is $12x^2 - 35x + 25$.

4. Factorise: $a^2 + b^2 - c^2 - d^2 + 2ab - 2cd$

5. Factorise: $a^6 - 7a^3 - 8$

6. Evaluate:

$$\frac{5.67 \times 5.67 \times 5.67 + 4.33 \times 4.33 \times 4.33}{5.67 \times 5.67 - 5.67 \times 4.33 + 4.33 \times 4.33}$$

7. Factorise: $x^2 + \dfrac{a^2 + 1}{a}x + 1$

8. Factorise: $x^4 + y^4 - 27x^2y^2$

9. Factorise: $4(2x - 3y)^2 - 8x + 12y - 3$

10. Factorise :

$2\sqrt{3}x^2 + x - 5\sqrt{3}$

11. Factorise the given expression completely:

$$6x^2 + 7x - 5$$

12. Factorise: $4a^2 - 9b^2 - 16x^2 + 24bc$

13. Factorise: $25a^2 - 9b^2 + 12bc - 4c^2$

14. Factorise: $x^3 - 3x^2 - x + 3$

4 Mark Questions

1. Factorise by taking out the common factors :

(i) $a^2 + \dfrac{1}{a^2} - 2 - 3a + \dfrac{3}{a}$

(ii) $m(x - 3y)^2 + n(3y - x) + 5x - 15y$

2. Factorise: $5 - (3a^2 - 2a)(6 - 3a^2 + 2a)$

3. Factorise: $\dfrac{1}{35} + \dfrac{12}{35}a + a^2$

4. For each trinomial (quadratic expression), given below find whether it is factorisable or not Factorise, if possible.

(i) $3x^2 + 4a - 10$, (ii) $x(2x - 1) - 1$

5. Factorise: (i) $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$

(ii) $7\sqrt{2}x^2 - 10x - 4\sqrt{2}$

6. Factorise :

$9a^2 + 3a - 8b - 64b^2$

7. Factorise: $x^4 + x^2 + 1$

8. Factorise: (i) $3x^7y - 81x^4y^4$

(ii) $a^3 + 0.064$

9. Show that:

(i) $13^3 - 5^3$ is divisible by 8.

(ii) $35^3 + 27^3$ is divisible by 62.

10. Find the value of:

(i) $(987)^2 - (13)^2$

(ii) $\dfrac{(18.5)^2 - (6.5)^2}{18.5 + 6.5}$

Questions

1. Factorise :

$$8ab^2 + 12a^2b$$

2. Factorise :

$$4(x + y)^2 - 3(x + y)$$

3. Foctorise :

$$x(a - 5) + y(5 - a)$$

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4. Factorise :

$$ab + bc + ax + cx$$

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5. Factorise :

$$ab^2 - (a - 1)b - 1.$$

6. Factorise :

$$a^2 + \frac{1}{a^2} + 2 - 5a - \frac{5}{a}.$$

7. Factorise :

$$x^2 + 5x + 6$$

8. Factorise :

$$x^2 - 5x + 6$$

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9. Factorise :

$$x^2 - 5x - 6$$

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10. Factorise :

$$x^2 + 5x - 6$$

11. Factorise :

$$2x^2 - 7x + 6$$

12. Factorise :

$$3x^2 - 11x - 4$$

13. Factorise :

$$6 + 11x + 3x^2$$

14. Factorise :

$$7 - 12x - 4x^2$$

15. Factorise :

$$x^2 + 7x + 6 + px + 6p$$

16. Factorise :

$$12 - \left(x + x^2\right)\left(8 - x - x^2\right).$$

17. Is $5x^2 + 17x + 6$ factorisable ? If yes, factorise it.

18. Is $3x^2 - 8x - 15$ factorisable ? If yes, factorise it.

19. Factorise :

$$x^2 - 25$$

20. Factorise :

$$9(x - y)^2 - (x + 2y)^2$$

21. Factorise :

$$48x^3 - 27x$$

22. Factorise :

$$16a^4 - b^4.$$

23. Factorise :

$$16x^2 - y^2 + 4yz - 4z^2$$

24. Factorise :

$$\left(1 - x^2\right)\left(1 - y^2\right) + 4xy$$

25. Factorise :

$$x^4 + x^2 y^2 + y^4$$

26. Factorise :

$$\left(p^2 + q^2 - r^2\right)^2 - 4p^2 q^2.$$

27. Factorise :

$$a^3 + 27b^3$$

28. Factorise :

$$16a^4 + 54a$$

29. Factorise :

$$125a^3 + \frac{1}{8}$$

30. Factorise :

$$a^3 + b^3 + a + b.$$

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31. Factorise :

$$8a^3 - 27b^3$$

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32. Factorise :

$$2a^7 - 128a$$

33. Show that :

$15^3 - 8^3$ is divisible by 7

34. Show that :

$15^3 + 8^3$ is divisible by 23.

35. Factorise :

$$x^2 + \frac{a^2 - 1}{a}x - 1$$

36. Factorise :

$$x^4 + y^4 - 23x^2y^2$$

37. Factorise :

$$a^2 + \frac{1}{a^2} - 18$$

38. Factorise :

$$a^4 - 7a^2 + 1$$

39. Factorise :

$$a^3 + 3a^2b + 3ab^2 + 2b^3.$$

40. Factorise : $a^6 - 26a^3 - 27$

1. Factorise by taking out the common factors :

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

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2. Factorise by taking out the common factors :

$$xy(3x^2 - 2y^2) - yz(2y^2 - 3x^2) + zx(15x^2 - 10y^2)$$

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3. Factorise by taking at the common factors:

(i)

$$ab(a^2 + b^2 - c^2) - bc(c^2 - a^2 - b^2) + ca(a^2 + b^2 - c^2)$$

(ii) $2x(a - b) + 3y(5a - 5b) + 4z(2b - 2a)$

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4. Factorise by taking out the common factors :

$$2x(a - b) + 3y(5a - 5b) + 4z(2b - 2a)$$

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5. Factorise by grouping method :

$$a^3 + a - 3a^2 - 3$$

6. Factorise by grouping method :

$$16(a + b)^2 - 4a - 4b$$

7. Factorise by grouping method :

$$a^4 - 2a^3 - 4a + 8$$

8. Factorise : $ab - 2b + a^2 - 2a$

9. Factorise by grouping method :

$$ab(x^2 + 1) + x(a^2 + b^2)$$

10. Factorise by grouping method :

$$a^2 + b - ab - a$$

11. Factorise : (v) $(ax + by)^2 + (bx - ay)^2$

12. Factorise by grouping method :

$$a^2 x^2 + (ax^2 + 1)x + a$$

13. Factorise by grouping method :

(2a-b)^(2) - 10a + 5b`

14. Factorise by grouping method :

$a(a - 4) - a + 4$

15. Factorise by grouping method :

$y^2 - (a + b)y + ab$

16. Factorise by grouping method :

$a^2 + \dfrac{1}{a^2} - 2 - 3a + \dfrac{3}{a}$

17. Factorise by grouping method :

$$x^2 + y^2 + x + y + 2xy$$

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18. Factorise by grouping method :

$$a^2 + 4b^2 - 3a + 6b - 4ab$$

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19. Factorise by grouping method :

$$m(x - 3y)^2 + n(3y - x) + 5x - 15y$$

20. Factorise by grouping method :

$$x(6x - 5y) - 4(6x - 5y)^2$$

Exercise 5 B

1. Factorise :

$$a^2 + 10a + 24$$

2. Factorise :

$$a^2 - 3a - 40$$

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3. Factorise :

$$1 - 2a - 3a^2$$

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4. Factorise :

$$x^2 - 3ax - 88a^2$$

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5. Factorise :

$$6a^2 - a - 15$$

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6. Factorise :

$$24a^3 + 37a^2 - 5a$$

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7. Factorise :

$$a(3a - 2) - 1$$

8. Factorise :

$$a^2b^2 + 8ab - 9$$

9. Factorise :

$$3 - a(4 + 7a)$$

10. Factorise :

$$(2a + b)^2 - 6a - 3b - 4$$

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11. Factorise :

$$1 - 2a - 2b - 3(a + b)^2$$

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12. Factorise :

$$3a^2 - 1 - 2a$$

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13. Factorise :

$$x^2 + 3x + 2 + ax + 2a$$

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14. Factorise :

$$(3x - 2y)^2 + 3(3x - 2y) - 10$$

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15. Factorise: $5 - \left(3a^2 - 2a\right)\left(6 - 3a^2 + 2a\right)$

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16. Factorise: $\dfrac{1}{35} + \dfrac{12}{35}a + a^2$

17. Factorise : $\left(x^2 - 3x\right)\left(x^2 - 3x - 1\right) - 20$

18. For each trinomial (quadratic expression), given below, find whether it is factorisable or not. Factorise. If possible.

$x^2 - 3x - 54$

19. For each trinomial (quadratic expression), given below, find whether it is factorisable or not. Factorise. If possible.

$$2x^2 - 7x - 15$$

20. For each trinomial (quadratic expression), given below, find whether it is factorisable or not. Factorise. If possible.

$$2x^2 + 2x - 75$$

21. For each trinomial (quadratic expression), given below find whether it is factorisable or not Factorise, if possible.

(i) $3x^2 + 4a - 10$, (ii) $x(2x - 1) - 1$

22. For each trinomial (quadratic expression), given below, find whether it is factorisable or not. Factorise. If possible.

$x(2x - 1) - 1$

23. Solve by factorization: $4\sqrt{3}x^2 + 5x - 2\sqrt{3} = 0$

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24. Factorise : $7\sqrt{2}x^2 - 10x - 4\sqrt{2}$

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25. Give possible experssions for the length and the breadth of the rectangular whose area is $12x^2 - 35x + 25$.

Exercise 5 C

1. Factorise :

$$25a^2 - 9b^2$$

2. Factorise :

$$a^2 - (2a + 3b)^2$$

3. Factorise :

$$a^2 - 81(b - c)^2$$

4. Factorise :

$$25(2a - b)^2 - 81b^2$$

5. Factorise :

$$50a^3 - 2a$$

6. Factorise :

$$4a^2b - 9b^3$$

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7. Factorise :

$$3a^5 - 108a^3$$

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8. Factorise :

$$9(a - 2)^2 - 16(a + 2)^2$$

9. Factorise :

$$a^4 - 1$$

10. Factorise :

$$a^3 + 2a^2 - a - 2$$

11. Factorise :

$$(a + b)^3 - a - b$$

12. Factorise :

$$a(a - 1) - b(b - 1)$$

13. Factorise :

$$4a^2 - \left(4b^2 + 4bc + c^2\right)$$

14. Factorise :

$$4a^2 - 49b^2 + 2a - 7b$$

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15. Factorise :

$$9a^2 + 3a - 8b - 64b^2$$

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16. Factorise :

$$4a^2 - 12a + 9 - 49b^2$$

17. Factorise :

$$4xy - x^2 - 4y^2 + z^2$$

18. Factorise :

$$a^2 + b^2 - c^2 - d^2 + 2ab - 2cd$$

19. Factorise :

$$4x^2 - 12ax - y^2 - z^2 - 2yz + 9a^2$$

20. Factorise :

$$\left(a^2 - 1\right)\left(b^2 - 1\right) + 4ab$$

21. Factorise :

$$x^4 + x^2 + 1$$

22. Factorise :

$$\left(a^2 + b^2 - 4c^2\right)^2 - 4a^2b^2$$

23. Factorise :

$$\left(x^2 + 4y^2 - 9z^2\right)^2 - 16x^2y^2$$

24. Factorise :

$$(a + b)^2 - a^2 + b^2$$

25. Factorise :

$$a^2 - b^2 - (a + b)^2$$

26. Factorise :

$$9a^2 - (a^2 - 4)^2$$

27. Factorise :

$$x^2 + \frac{1}{x^2} - 11$$

28. Factorise :

$$4x^2 + \frac{1}{4x^2} + 1$$

29. Factorise :

$$4x^4 - x^2 - 12x - 36$$

30. Factorise :

$$a^2(b+c) - (b+c)^3$$

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Exercise 5 D

1. Factorise :

$$a^3 - 27$$

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2. Factorise :

$$1 - 8a^3$$

3. Factorise :

$$64 - a^3 b^3$$

4. Factorise :

$$a^6 + 27b^3$$

5. Factorise: (i) $3x^7y - 81x^4y^4$

(ii) $a^3 + 0.064$

6. Factorise :

$a^3 - \left(\dfrac{27}{a^3}\right)$

7. Factorise :

$a^3 + 0.064$

8. Factorise :

$$a^4 - 343a$$

9. Factorise :

$$(x - y)^3 - 8x^3$$

10. Factorise :

$$\frac{8a^3}{27} - \frac{b^3}{8}$$

11. Factorise :

$$a^6 - b^6$$

12. Factorise :

$$a^6 - 7a^3 - 8$$

13. Factorise :

$$a^3 - 27b^3 + 2a^2b - 6ab^2$$

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14. Factorise :

$$8a^3 - b^3 - 4ax + 2bx$$

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15. Factorise :

$$a - b - a^3 + b^3$$

16. Factorise :

$$2x^3 + 54y^3 - 4x - 12y$$

17. Factorise :

$$1029 - 3x^3$$

18. Show that:

(i) $13^3 - 5^3$ is divisible by 8.

(ii) $35^3 + 27^3$ is divisible by 62.

19. Show that :

$35^3 + 27^3$ is divisible by 62.

20. Evaluate:

$$\frac{5.67 \times 5.67 \times 5.67 + 4.33 \times 4.33 \times 4.33}{5.67 \times 5.67 - 5.67 \times 4.33 + 4.33 \times 4.33}$$

Exercise 5 E

1. Factorise :

$$x^2 + \frac{1}{4x^2} + 1 - 7x - \frac{7}{2x}$$

2. Factorise :

$$9a^2 + \frac{1}{9a^2} - 2 - 12a + \frac{4}{3a}$$

3. Factorise: $x^2 + \dfrac{a^2 + 1}{a}x + 1$

4. Factorise: $x^4 + y^4 - 27x^2y^2$

5. Factorise :

$4x^4 + 9y^4 + 11x^2y^2$

6. Factorise :

$$x^2 + \frac{1}{x^2} - 3$$

7. Factorise :

$$a - b - 4a^2 + 4b^2$$

8. Factorise :

$$(2a - 3)^2 - 2(2a - 3)(a - 1) + (a - 1)^2$$

9. Factorise :

$$\left(a^2 - 3a\right)\left(a^2 - 3a + 7\right) + 10$$

10. Factorise :

$$\left(a^2 - a\right)\left(4a^2 - 4a - 5\right) - 6$$

11. Factorise :

$$x^4 + y^4 - 3x^2y^2$$

12. Factorise :

$$5a^2 - b^2 - 4ab + 7a - 7b$$

13. Factorise :

$$12(3x - 2y)^2 - (3x - 2y) - 1$$

14. Factorise: $4(2x - 3y)^2 - 8x + 12y - 3$

15. Factorise :

$$3 - 5x + 5y - 12(x - y)^2$$

16. Factorise :

$$9x^2 + 3x - 8y - 64y^2$$

17. Factorise :

$$2\sqrt{3}x^2 + x - 5\sqrt{3}$$

18. Factorise :

$$\frac{1}{4}(a+b)^2 - \frac{9}{16}(2a-b)^2.$$

19. Factorise

$$2(ab+cd) - a^2 - b^2 + c^2 + d^2$$

20. Find the value of :

$$(987)^2 - (13)^2$$

21. Find the value of :

$$(67.8)^2 - (32.2)^2$$

22. Find the value of :

$$\frac{(6.7)^2 - (3.3)^2}{6.7 - 3.3}$$

23. Find the value of :

$$\frac{(18.5)^2 - (6.5)^2}{18.5 + 6.5}$$