



# MATHS

## BOOKS - ICSE

### FACTORISATION

#### Example

1. Factorise : (i)  $5x^2 - 10x$

A.  $2x(5x - 2)$

B.  $5x(x - 2)$

C.  $5x(x - 10)$

D.  $5(x - 2)$

**Answer: B**



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2. Factorise : (ii)  $3x^2y - 6xy^2 + 9xy$



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3. Factorise : (i)  $10a^4x^2 - 15a^6x^4 + 20a^7x^5$



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4. Factorise : (ii)  $2x(a + b) - 3y(a + b)$



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5. Factorise:  $ax - bx + ay - by$



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6. Factorise : (i)  $y^3 - 3y^2 + 2y - 6 - xy + 3x$



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7. Factorise : (ii)  $a^2 - (b + 5)a + 5b$



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8. Factorise :  $25a^2 - 36b^2$



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9. Factorise : (i)  $1 - 4(a - 2b)^2$



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10. Factorise : (ii)  $9(x + y)^2 - 16(x - 3y)^2$



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11. Find the numbers whose : (i) product = 6  
and sum = 5



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**12.** Find the numbers whose : (ii) product = 6  
and sum = - 5



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**13.** Find the numbers whose : (iii) product  
= - 6 and sum = 5



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**14.** Find the numbers whose : (iv) product  
 $= -6$  and sum  $= -5$



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**15.** Factorise : (i)  $x^2 - 9x + 20$



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**16.** Factorise : (ii)  $y^2 + 5y - 24$



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17. Factorise : (iii)  $1 - 3a - 28a^2$



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18. Factorise : (i)  $(a + b)^2 - 11(a + b) - 42$



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19. Factorise : (ii)  $7 + 10(x - y) - 8(x - y)^2$



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20. (i) Is  $4x^2 + 12xy + 9y^2$  a perfect square trinomial ?



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21. Is  $x^2 - 6xy + 36y^2$  a perfect square trinomial ?



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22. Factorise completely : (i)  $8x^3 - 18xy^2$



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23. Factorise completely : (ii)  $3x^2 + 12x - 36$



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24. Factorise completely :

$$x^2 + 4xy + 4y^2 - 9z^2$$



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25. Factorise completely :  $16x^4 - y^4$



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## Exercise 13 A

1. Factorise :  $15x + 5$



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2. Factorise :  $a^3 - a^2 + a$



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3. Factorise :  $3x^2 + 6x^3$



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4. Factorise :  $4a^2 - 8ab$



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5. Factorise :  $2x^3b^2 - 4x^5b^4$



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6. Factorise :  $15x^4y^3 - 20x^3y$



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7. Factorise :  $a^3b - a^2b^2 - b^3$



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8. Factorise :  $6x^2y + 9xy^2 + 4y^3$



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9. Factorise :  $17a^6b^8 - 34a^4b^6 + 51a^2b^4$



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10. Factorise :  $3x^5y - 27x^4y^2 + 12x^3y^3$



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11.

Factorise

:

$$x^2(a - b) - y^2(a - b) + z^2(a - b)$$



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12.

Factorise

:

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



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13. Factorise :  $2b(2a + b) - 3c(2a + b)$



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14. Factorise :  $12abc - 6a^2b^2c^2 + 3a^3b^3c^3$



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15. Factorise :  $4x(3x - 2y) - 2y(3x - 2y)$



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16. Factorise :

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



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17. Factorise :

$$6xy(a^2 + b^2) + 8yz(a^2 + b^2) - 10xz(a^2 + b^2)$$



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Exercise 13 B

1. Factorise :  $a^2 + ax + ab + bx$



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2. Factorise :  $a^2 - ab - ca + bc$



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



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4. Factorise :  $a^3 - a^2 + a - 1$



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5. Factorise :  $2a - 4b - xa - 2bx$



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6. Factorise :  $xy - ay - ax + a^2 + bx - ab$



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7. Factorise :  $3x^5 - 6x^4 - 2x^3 + 4x^2 + x - 2$



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8. Factorise :  $-x^2y - x + 3xy + 3$



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9. Factorise :  $6a^2 - 3a^2b - bc^2 + 2c^2$



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10. Factorise :  $3a^2b - 12a^2 - 9b + 36$



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11. Factorise :  $x^2 - (a - 3)x - 3a$



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12. Factorise :  $x^2 - (b - 2)x - 2b$



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13. Factorise :  $a(b - c) - d(c - b)$



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14. Factorise :  $ab^2 - (a - c)b - c$



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15. Factorise :  $(a^2 - b^2)c + (b^2 - c^2)a$



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16. Factorise :  $a^3 - a^2 - ab + a + b - 1$



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17. Factorise :  $ab(c^2 + d^2) - a^2cd - b^2cd$



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18. Factorise :  $2ab^2 - aby + 2cby - cy^2$



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19. Factorise :  $ax + 2bx + 3cx - 3a - 6b - 9c$



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20. Factorise :

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



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Exercise 13 C



1. Factorise :  $16 - 9x^2$



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2. Factorise :  $1 - 100a^2$



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3. Factorise :  $4x^2 - 81y^2$



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4. Factorise :  $\frac{4}{25} - 25b^2$



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



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6. Factorise :  $(5a - 3b)^2 - 16b^2$



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7. Factorise :  $a^4 - (a^2 - 3b^2)^2$



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8. Factorise :  $(5a - 2b)^2 - (2a - b)^2$



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9. Factorise :  $1 - 25(a + b)^2$



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10. Factorise :  $4(2a + b)^2 - (a - b)^2$



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11. Factorise :  $25(2x + y)^2 - 16(x - y)^2$



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12. Factorise :  $49(x - y)^2 - 9(2x + y)^2$



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13. Factorise :  $\left(6\frac{2}{3}\right)^2 - \left(2\frac{1}{3}\right)^2$



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14. Factorise :  $\left(7\frac{3}{10}\right)^2 - \left(2\frac{1}{10}\right)^2$



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15. Factorise :  $(0.7)^2 - (0.3)^2$



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16. Factorise :  $(4.5)^2 - (1.5)^2$



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17. Factorise :  $75(x + y)^2 - 48(x - y)^2$



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18. Factorise :  $a^2 + 4a + 4 - b^2$



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19. Factorise :  $a^2 - b^2 - 2b - 1$



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20. Factorise :  $x^2 + 6x + 9 - 4y^2$



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## Exercise 13 D

1. Factorise :  $x^2 + 6x + 8$



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2. Factorise :  $x^2 + 4x + 3$



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3. Factorise :  $a^2 + 5a + 6$



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4. Factorise :  $a^2 - 5a + 6$





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5. Factorise :  $a^2 + 5a - 6$



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6. Factorise :  $x^2 + 5xy + 4y^2$



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7. Factorise :  $a^2 - 3a - 40$



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**8. Factorise :  $x^2 - x - 72$**



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**9. Factorise :  $x^2 - 10xy + 24y^2$**



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**10. Factorise :  $2a^2 + 7a + 6$**



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**11. Factorise :  $3a^2 - 5a + 2$**



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**12. Factorise :  $7b^2 - 8b + 1$**



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**13. Factorise :  $2a^2 - 17ab + 26b^2$**



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**14. Factorise :**  $2x^2 + xy - 6y^2$



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**15. Factorise :**  $4x^2 + 3x - 10$



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**16. Factorise :**  $16x^2 - 8x - 3$



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17. Factorise :  $6 + 7b - 3b^2$



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18. Factorise :  $5 + 7x - 6x^2$



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19. Factorise :  $4 + y - 14y^2$



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**20. Factorise :  $5 + 3a - 14a^2$**



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**21. Factorise :  $(2a + b)^2 + 5(2a + b) + 6$**



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**22. Factorise :  $1 - (2x + 3y) - 6(2x + 3y)^2$**



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**23. Factorise :**  $(x - 2y)^2 - 12(x - 2y) + 32$



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**24. Factorise :**  $8 + 6(a + b) - 5(a + b)^2$



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**25. Factorise :**  $2(x + 2y)^2 - 5(x + 2y) + 2$



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## Exercise 13 E

1. In each case, find whether the trinomial is a perfect square or not :

(i)  $x^2 + 14x + 49$



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2. In each case, find whether the trinomial is a perfect square or not :

(ii)  $a^2 - 10a + 25$



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3. In each case, find whether the trinomial is a perfect square or not :

(iii)  $4x^2 + 4x + 1$



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4. In each case, find whether the trinomial is a perfect square or not :

$$9b^2 + 12b + 16$$



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5. In each case, find whether the trinomial is a perfect square or not :

(v)  $16x^2 - 16xy + y^2$



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6. In each case, find whether the trinomial is a perfect square or not :

(vi)  $x^2 - 4x + 16$



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7. Factorise completely :  $2 - 8x^2$



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8. Factorise completely :  $8x^2y - 18y^3$



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9. Factorise completely :  $ax^2 - ay^2$



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10. Factorise completely :  $25x^3 - x$



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11. Factorise completely :  $a^4 - b^4$



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12. Factorise completely :  $16x^4 - 81y^4$



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13. Factorise completely :  $625 - x^4$



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14. Factorise completely :  $x^2 - y^2 - 3x - 3y$



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15. Factorise completely :  $x^2 - y^2 - 2x + 2y$



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16. Factorise completely :  $3x^2 + 15x - 72$



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17. Factorise completely :  $2a^2 - 8a - 64$



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18. Factorise completely :  $5b^2 + 45b + 90$



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19. Factorise completely :  $3x^2y + 11xy + 6y$



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20. Factorise completely :  $5ap^2 + 11ap + 2a$



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21. Factorise completely :  $a^2 + 2ab + b^2 - c^2$



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22. Factorise completely :

$$x^2 + 6xy + 9y^2 + x + 3y$$



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23. Factorise completely :

$$4a^2 - 12ab + 9b^2 + 4a - 6b$$



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24. Factorise completely :  $2a^2b^2 - 98b^4$



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25. Factorise completely :  $a^2 - 16b^2 - 2a - 8b$



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## Exercise 13 F

1. Factorise : (i)  $6x^3 - 8x^2$



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2. Factorise : (ii)  $35a^3b^2c + 42ab^2c^2$



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3. Factorise : (iii)  $36x^2y^2 - 30x^3y^3 + 48x^3y^2$



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4. Factorise : (iv)  $8(2a + 3b)^3 - 12(2a + 3b)^2$



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5. Factorise : (v)  $9a(x - 2y)^4 - 12a(x - 2y)^3$



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6. Factorise : (i)  $a^2 - ab - 3a + 3b$



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7. Factorise : (ii)  $x^2y - xy^2 + 5x - 5y$



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8. Factorise : (iii)  $a^2 - ab(1 - b) - b^3$



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9. Factorise : (iv)  $xy^2 + (x - 1)y - 1$



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



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11. Factorise : (vi)  $ab(x^2 + y^2) - xy(a^2 + b^2)$



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12. Factorise : (vii)

$$m - 1 - (m - 1)^2 + am - a$$



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13. Factorise : (i)  $a^2 - (b - c)^2$



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14. Factorise : (ii)  $25(2x - y)^2 - 16(x - 2y)^2$



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15. Factorise : (iii)  $9x^2 - \frac{1}{16}$



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16. Factorise : (iv)  $9x^2 - \frac{1}{16}$



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17. Factorise : (v)  $25(x - 2y)^2 - 4$



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18. Factorise : (i)  $a^2 - 23a + 42$ .



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19. Factorise : (ii)  $a^2 - 23a - 108$



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20. Factorise : (iii)  $1 - 18x - 63x^2$



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21. Factorise : (iv)  $5x^2 - 4xy - 12y^2$



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22. Factorise : (v)  $x(3x + 14) + 8$



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23. Factorise : (vi)  $5 - 4(1 + 3x)$



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24. Factorise : (vii)  $x^2y^2 - 3xy - 40$



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25. Factorise : (viii)

$$(3x - 2y)^2 - 5(3x - 2y) - 24$$



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26. Factorise : (ix)  $12(a + b)^2 - (a + b) - 35$



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27. Factorise : (i)  $15(5x - 4)^2 - 10(5x - 4)$



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28. Factorise : (ii)  $3a^2x - bx + 3a^2 - b$



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29. Factorise : (iii)

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



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30. Factorise : (iv)  $ax^2 + b^2y - ab^2 - x^2y$



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31. Factorise : (v)  $1 - 3x - 3y - 4(x + y)^2$



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**32.** Factorise :  $2a^3 - 50a$



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**33.** Factorise : (ii)  $54a^2b^2 - 6$



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**34.** Factorise : (iii)  $64a^2b - 144b^3$



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**35. Factorise :** (iv)  $(2x - y)^3 - (2x - y)$



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**36. Factorise :** (v)  $x^2 - 2xy + y^2 - z^2$



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**37. Factorise :** (vi)  $x^2 - y^2 - 2yz - z^2$



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**38.** Factorise : (vii)  $7a^5 - 567a$



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**39.** Factorise : (viii)  $5x^2 - \frac{20x^4}{9}$



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**40.** Factorise  $xy^2 - xz^2$ , Hence, find the value

of : (i)  $9 \times 8^2 - 9 \times 2^2$



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**41.** Factorise  $xy^2 - xz^2$ , Hence, find the value of : (ii)  $40 \times 5.5^2 - 40 \times 4.5^2$



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**42.** Factorise : (i)  $(a - 3b)^2 - 36b^2$



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**43.** Factorise : (ii)  $25(a - 5b)^2 - 4(a - 3b)^2$



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**44.** Factorise : (iii)  $a^2 - 0.36b^2$



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**45.** Factorise : (iv)  $a^4 - 625$



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**46.** Factorise : (v)  $x^4 - 5x^2 - 36$



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**47.** Factorise : (vi)

$$15(2x - y)^2 - 16(2x - y) - 15$$



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**48.** Factorise  $a^2b - b^3$ . Using this result, find the value of  $101^2 \times 100 - 100^3$



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49. Evaluate (using factors) :

$$301^2 \times 300 - 300^2.$$



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