MATHS

NCERT - NCERT MATHEMATICS(ENGLISH)

FACTORISATION

Exercise 14 2

1. Factorise. (i) $a^4 - b^4$ (ii) $p^4 - 81$ (iii) $x^4 - (y+z)^4$ (iv) $x^4 - (x-z)^4$

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

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2. Factorise the following expressions.

(i) $p^2 + 6p + 8$

(ii) $q^2 - 10q + 21$

(iii) $p^2 + 6p - 16$

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3. Factorise. (i) $4p^2 - 9q^2$ (ii) $63a^2 - 112b^2$ (iii) $49x^2 - 36$ (iv) $16x^5 - 144x^3$ (v) $(l+m)^2 - (l- \ -m)^2$ (vi) $9x^2y^2 - 16$ (vii) $\left(x^2 - 2xy + y^2\right) - z^2$ (viii) $25a^2 - 4b^2 + 28bc - 49c^2$

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4. Factorise the expressions. (i) $ax^2 + bx$ (ii) $7p^2 + 21q^2$ (iii) $2x^3 + 2xy^2 + 2xz^2$ (iv) $am^2 + bm^2 + bn^2 + an^2$ (v)

$(lm + l) + m + 1$ (vi) $y(y + z) + 9(y + z)$

(vii) $5y^2 - 20y - 8z + 2yz$ (viii)

$10ab + 4a + 5b + 2$ (ix) $6xy - 4y + 6 - 9x$

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5. Factorise the following expressions. (i)

$a^2 + 8x + 16$ (ii) $p^2 - 10p + 25$ (iii)

$25m^2 + 30m + 9$ (iv) $49y^2 + 84yz + 36z^2$ (v)

$4x^2 - 8x + 4$ (vi) $121b^2 - 88bc + 16c^2$ (vii)

$(l + m)^2 - 4lm$ (Hint : Expand $(l + m)^2$ first

(viii) $a^4 + 2a^2b^2 + b^4$

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Solved Examples

1. Divide $z\left(5z^2 - 80\right)$ by $5z(z + 4)$

A. $z + 4$

B. $z - 5$

C. $z - 4$

D. $z + 5$

Answer: C

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2. Divide $44\left(x^4 - 5x^3 - 24x^2\right)$ by $11x(x - 8)$

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3. Divide $24\left(x^2yz + xy^2z + xyz^2\right)$ by 8xyz` using both the methods.

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4. Do the following divisions. (i) $-20x^4 \div 10x^2$

(ii) $7x^2y^2z^2 \div 14xyz$

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5. Find the factors of $3m^2 + 9m + 6$.

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6. Obtain the factors of $z^2 - 4z - 12$.

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7. Find the factors of $y^2 - 7y + 12$

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8. Factorise: $m^4 - 256$

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9. Factorise :

$x^2 + 5x + 6$

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10. Factorise $12a^2b + 15ab^2$

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11. Factorise : $10x^2 - 18x^3 + 14x^4$

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12. Factorise : $6xy - 4y + 6 - 9x.$

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13. Factorise : $x^2 + 8x + 16$

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14. Factorise : $4y^2 - 12y + 9$

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15. Factorise : $49p^2 - 36$

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16. Factorise $a^2 - 2ab + b^2 - c^2$

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Exercise 14 4

1. Find and correct the errors in the mathematical statements.

$(2x)^2 + 5x = 4x + 5x = 9x$

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2. Find and correct the errors in the mathematical statements.

$(3x + 2)^2 = 3x + 6x + 4$

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3. Find and correct the errors in the following mathematical statements.

$\frac{4x + 5}{4x} = 5$

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4. Find and correct the errors in the mathematical statements. $4(x-5)=4x-5$

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5. Find and correct the errors in the mathematical statements.

$x(3x+2)=3x^2+2$

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6. Find and correct the errors in the mathematical statements. $2x + 3y = 5xy$

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7. Find and correct the errors in the mathematical statements. $x + 2x + 3x = 5x$

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8. Find and correct the errors in the mathematical statements.

$5y + 2y + y - 7y = 0$

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9. Find and correct the errors in the mathematical statements. $3x + 2x = 5x^2$

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10. Find and correct the errors in the mathematical statements.

$$(2x)^2 + 4(2x) + 7 = 2x^2 + 8x + 7$$

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11. Find and correct the errors in the following mathematical statements.

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

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12. Find and correct the errors in the following mathematical statements.

$$\frac{3x^2}{3x^2} = 0$$

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13. Find and correct the errors in the following mathematical statements.

$$(a-4)(a-2) = a^2 - 8$$

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14. Find and correct the errors in the following mathematical statements.

$(a+4)(a+2) = a^2 + 8$

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15. Find and correct the errors in the following mathematical statements.

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

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16. Find and correct the errors in the following mathematical statements.

$$(z+5)^2 = z^2 + 25$$

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17. Find and correct the errors in the following mathematical statements.

$$(y-3)^2 = y^2 - 9$$

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18. Substituting $x = -3$ in $x^2 + 5x$ gives

$(-3)^2 + 5(-3) = -9 - 15 = 24$

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19. Find and correct the errors in the following mathematical statements.

$$\frac{7x + 5}{5} = 7x$$

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20. $\frac{3}{4x+3} = \frac{1}{4x}$

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21. solve for x $\frac{3x}{3x+2} = \frac{1}{2}$

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Exercise 14 3

1. Factorise the expressions and divide them as directed. (i) $\left(y^2+7y+10\right) \div (y+5)$ (ii) $\left(m^2-14m-32\right) \div (m+2)$ (iii) $\left(5p^2-25p+20\right) \div (p-1)$ (iv) $\left(4yz\left(z^2+6z-16\right) \div 2y(z+8)\right.$ (v) $5pq\left(p^2-q^2\right) \div 2p(p+q)$ (vi) $12xy\left(9x62-16y^2\right) \div 4xy(3x+4y)$ (vii) $39y^3\left(50y^2-98\right) \div 26y^2(5y+7)$

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2. Divide as directed. (i)

$5(2x+1)(3x+5) \div (2x+1)$ (ii)

$26xy(x+5)(y-4) \div 13x(y-4)$

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3. Carry out the following divisions.

(i) $28x^4 \div 56x$

(ii) $-36y^3 \div 9y^2$

(iii) $66pq^2r^3 \div 11qr^2$

(iv) $34x^3y^3z^3 \div 51xy^2z^3$

(v) $12a^8b^8 \div (-6a^6b^4)$

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4. Work out the following divisions.

(i) $(10x - 25) \div 5$

(ii) $(10x - 25) \div (2x - 5)$

(iii) $10y(6y + 21) \div 5(2y + 7)$

(iv)

$96abc(3a - 12)(5b - 30) \div 144(a - 4)(b - 6)$

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5. Divide the given polynomial by the given monomial.

(i) $\left(5x^2 - 6x\right) \div 3x$

(ii) $\left(3y^8 - 4y^6 + 5y^4\right) \div y^4$

(iii) $8\left(x^3y^2z^2 + x^2y^3z^2 + x^2y^2z^3\right) \div 4x^2y^2z^2$

(iv) $\left(x^3 + 2x^2 + 3x\right) \div 2x$

(v) $\left(p^3q^6 - p^6q^3\right) \div p^3q^3$

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Exercise 14 1

1. Factorise.

(i) $x^2 + xy + 8x + 8y$

(ii) $15xy - 6x + 5y - 2$

(iii) $ax + bx - ay - by$

(iv) $15pq + 15 + 9q + 25p$

(v) $z - 7 + 7xy - xyz$

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2. Factorise the following expressions.

(i) $7x - 42$

(ii) $6p - 12q$

(iii) $7a^2 + 14a$

(iv) $-16z + 20z^3$

(v) $20l^2m + 30alm$

(vi) $5x^2y - 15xy^2$

(vii) $10a^2 - 15b^2 + 20c^2$

(viii) $-4a^2 + 4ab - 4ca$

(ix) $x^2yz + xy^2z + xyz^2$

(x) $ax^2y + bxy^2 + cxyz$

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3. Find the common factors of the given terms.

(i) $12x, 36$

(ii) $2y, 22xy$

(iii) $14pq, 28p^2q^2$

(iv) $2x, 3x^2, 4$

(v) $6abc, 24ab^2, 12a^2b$

(vi) $16x^3, \ -4x^2, 32x$

(vii) $10pq, 20qr, 30rp$

(viii) $3x^2y^3, 10x^3y^2, 6x^2y^2z$

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