MATHS

NCERT - NCERT MATHEMATICS(TAMIL ENGLISH)

ALGEBRA

Example

1. Find the degree of each term for the following polynomial and also find the degree of the polynomial $6ab^8 + 5a^2b^3c^2 - 7ab + 4b^2c + 2$

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2. If $p(x) = 4x^2 - 3x + 2x^3 + 5$ and $q(x) = x^3 + 2x + 4$, then find $p(x) + q(x)$

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3. If $p(x) = 4x^2 - 3x + 2x^3 + 5$ and $g(x) = x^2 + 2x + 4$, then find $p(x) - q(x)$

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4. Find the product $(4x - 5)$ and $\left(2x^2 + 3x - 6\right)$

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5. If $f(x) = x^2 - 4x + 3$, then find the values of $f(1), f(-1), f(2), f(3)$. Also fi nd the zeros of the polynomial f(x).

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6. Find the roots of the following polynomial equations

$5x - 3 = 0$

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7. Find the roots of the following polynomial equations

$-7 - 4x = 0$

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8. Find the value of m, if $(x - 2)$ is a factor of the polynomial $2x^3 - 6x^2 + mx + 4$.

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9. Expand the following using identities:

$(3x + 4y)^2$

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10. Expand the following using identities:

$(2a - 3b)^2$

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11. Expand the following using identities:

$(5x + 4y)(5x - 4y)$

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12. Expand the following using identities:

$(m + 5)(m - 8)$

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13. Expand $(a - b + c)^2$

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14. Expand $(2x + 3y + 4z)^2$

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15. Find the area of square whose side length is $3m + 2n - 4l$

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16. Expand the following:

$(x + 5)(x + 6)(x + 4)$

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17. Expand the following:

$(3x-1)(3x+2)(3x-4)$

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18. Expand $(5a-3b)^3$

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19. Find the product of

$(2x+3y+4z)\left(4x^2+9y^2+16z^2-6xy-12yz-8zx\right)$

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20. Evaluate $10^3-15^3+5^3$

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21. Factorise the following:

am + bm + cm

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22. Factorise the following:

$a^3 - a^2b$

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23. Factorise the following:

$5a - 10b - 4bc + 2ac$

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24. Factorise the following:

$x + y - 1 - xy$

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25. Factorise the following:

$9x^2 + 12xy + 4y^2$

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26. Factorise the following:

$25a^2 - 10a + 1$

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27. Factorise the following:

$336m^2 - 49n^2$

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28. Factorise the following:

$x^3 - x$

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29. Factorise the following:

$x^4 - 16$

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30. Factorise the following:

$x^2 + 4y^2 + 9z^2 - 4xy + 12yz - 6xz$

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31. Factorise the following

$27x^3 + 125y^3$

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32. Factorise the following

$216m^3 - 343n^3$

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33. Factorise the following

$2x^4 - 16xy^3$

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34. Factorise the following

$8x^3 + 27y^3 + 64z^3 - 72xyz$

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35. Factorise $2x^2 + 15x + 27$

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36. Factorise $2x^2 - 15x + 27$

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37. Factorise $2x^2 + 15x - 27$

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38. Factorise $2x^2 - 15x - 27$

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39. Factorise $(x+y)^2+9(x+y)+20$

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40. Divide x^3-4x^2+6x by x, where, $x \neq 0$

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41. Find quotient and the remainder when f(x) is divided by g(x)

$f(x)=\left(8x^3-6x^2+15x-7\right), g(x)=2x+1$

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42. Find quotient and the remainder when f(x) is divided by g(x)

$f(x)=x^4-3x^3+5x^2-7, g(x)=x^2+x+1$

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43. Find the quotient and remainder when $p(x) = \left(3x^3 - 2x^2 - 5 + 7x\right)$ is divided by $d(x) = x + 3$ using synthetic division

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44. Find the quotient and remainder when $\left(3x^3 - 4x^2 - 5\right)$ is divided by $(3x + 1)$ using synthetic division

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45. If the quotient on dividing $x^4 + 10x^3 + 35x^2 + 50x + 29$ by $(x + 4)$ is $x^3 - ax^2 + bx + 6$, then find the value of a, b and also remainder.

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46. Factorise $x^3 + 13x^2 + 32x + 20$ into linear factors

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47. Factorise $x^3 - 5x^2 - 2x + 24$

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48. Find GCD of the following:

$16x^3y^2, 24xy^3z$

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49. Find GCD of the following:

$(y^3 + 1)$ and $(y^2 - 1)$

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50. Find GCD of the following:

$2x^2 - 18$ and $x^2 - 2x - 3$

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51. Find GCD of the following:

$(a-b)^2, (b-c)^3, (c-a)^4$

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52. Check whether $(5, -1)$ is a solution of the simultaneous equations $x - 2y = 7$ and $2x + 3y = 7$.

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53. Use graphical method to solve the following system of equations:

$x + y = 5, 2x - y = 4.$

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54. Th e sum of the digits of a given two digit number is 5. If the digits are reversed, the new number is reduced by 27. Find the given number.

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55. Given $4a + 3b = 65$ and $a + 2b = 35$ solve by elimination method.

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56. Solve for x and y: $8x - 3y = 5xy, 6x - 5y = -2xy$ by the method of elimination.

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57. Solve $3x - 4y = 10$ and $4x + 3y = 5$ by the method of cross multiplication.

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58. Solve by cross multiplication method : $3x + 5y = 21, \ -7x - 6y = \ -49$

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59. Check whether the following system of equation is consistent or inconsistent and say how many solutions we can have if it is consistent $2x - 4y = 7, x - 3y = \ -2$

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60. Check whether the following system of equation is consistent or inconsistent and say how many solutions we can have if it is consistent

$4x + y = 3, 8x + 2y = 6$

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61. Check whether the following system of equation is consistent or inconsistent and say how many solutions we can have if it is consistent

$4x + 7 = 2y, 2x + 9 = y$

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62. Check the value of k for which the given system of equations $kx + 2y = 3, 2x - 3y = 1$ has a unique solution.

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63. Find the value of k, for the following system of equation has infi nitely many solutions.

$2x - 3y = 7, (k + 2)x - (2k + 1)y = 3(2k - 1)$

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64. Find the value of k for which the system of linear equations $8x + 5y = 9, kx + 10y = 15$ has no solution

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Exercise 3 1

1. Which of the following expressions are polynomials. If not give reason:

$\frac{1}{x^2} + 3x - 4$

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2. Which of the following expressions are polynomials. If not give reason:

$x^2(x-1)$

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3. Which of the following expressions are polynomials. If not give reason:

$\frac{1}{x}(x+5)$

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4. Which of the following expressions are polynomials. If not give reason:

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

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5. Which of the following expressions are polynomials. If not give reason:

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

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6. Which of the following expressions are polynomials. If not give reason:

$m^2 - \sqrt[3]{m} + 7m - 10$

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7. Write the coefficient of x^2 and x in each of the following polynomials.

$4 + \frac{2}{5}x^2 - 3x$

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8. Write the coefficient of x^2 and x in each of the following polynomials.

$6 - 2x^2 + 3x^3 - \sqrt{7}x$

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9. Write the coefficient of x^2 and x in each of the following polynomials.

$\pi x^2 - x + 2$

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10. Write the coefficient of x^2 and x in each of the following polynomials.

$\sqrt{3}x^2 + \sqrt{2}x + 0.5$

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11. Write the coefficient of x^2 and x in each of the following polynomials.

$x^2 - \frac{7}{2}x + 8$

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12. Find the degree of the following polynomials.

$1 - \sqrt{2}y^2 + y^7$

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13. Find the degree of the following polynomials.

$\frac{x^3 - x^4 + 6x^6}{x^2}$

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14. Find the degree of the following polynomials.

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

View Text Solution

15. Find the degree of the following polynomials.

$3x^4 + 9x^2 + 27x^6$

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16. Find the degree of the following polynomials.

$2\sqrt{5}p^4 - \frac{8p^3}{\sqrt{3}} + \frac{2p^2}{7}$

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17. Rewrite the following polynomial in standard form

$x - 9 + \sqrt{7}x^3 + 6x^2$

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18. Rewrite the following polynomial in standard form

$$\sqrt{2}x^2 - \frac{7}{2}x^4 + x - 5x^3$$

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19. Rewrite the following polynomial in standard form

$$7x^3 - \frac{6}{5}x^2 + 4x - 1$$

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20. Rewrite the following polynomial in standard form

$$y^2 + \sqrt{5}y^3 - 11 - \frac{7}{3}y + 9y^4$$

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21. Add the following polynomials and find the degree of the resultant polynomial.

$p(x) = 6x^2 - 7x + 2 \quad q(x) = 6x^3 - 7x + 15$

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22. Add the following polynomials and find the degree of the resultant polynomial.

$h(x) = 7x^3 - 6x + 1 \quad f(x) = 7x^2 + 17x - 9$

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23. Add the following polynomials and find the degree of the resultant polynomial.

$f(x) = 16x^4 - 5x^2 + 9 \quad g(x) = -6x^3 + 7x - 15$

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24. Subtract the second polynomial from the first polynomial and find the degree of the resultant polynomial.

$p(x) = 7x^2 + 6x - 1 \quad q(x) = 6x - 9$

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25. Subtract the second polynomial from the first polynomial and find the degree of the resultant polynomial.

$f(y) = 6y^2 - 7y + 2 \quad g(y) = 7y + y^3$

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26. Subtract the second polynomial from the first polynomial and find the degree of the resultant polynomial.

$h(z) = z^3 - 6z^4 + z \quad f(z) = 6z^2 + 10z - 7$

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27. What should be added to $2x^3 + 6x^2 - 5x + 8$ to get $3x^3 - 2x^2 + 6x + 15$?

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28. What must be subtracted from $2x^4 + 4x^2 - 3x + 7$ to get $3x^3 - x^2 + 2x + 1$?

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29. Multiply the following polynomials and find the degree of the resultant polynomial:

$p(x) = x^2 - 9 \quad q(x) = 6x^2 + 7x - 2$

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30. Multiply the following polynomials and find the degree of the resultant polynomial:

$f(x) = 7x + 2 \quad q(x) = 15x - 9$

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31. Multiply the following polynomials and find the degree of the resultant polynomial:

$h(x) = 6x^2 - 7x + 1 \quad f(x) = 5x - 7$

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32. The cost of a chocolate is Rs. (x + y) and Amir bought (x + y) chocolates. Find the total amount paid by him in terms of x and y. If x =10, y =5 find the amount paid by him.

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33. The length of a rectangle is (3x+2) units and it's breadth is (3x–2) units. Find its area in terms of x. What will be the area if x = 20 units.

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34. p(x) his a polynomial of degree 1 and q(x) is a polynomial of degree 2. What kind of the polynomial $p(x) \times q(x)$ is ?

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Exercise 3 2

1. Find the value of the polynomial $f(y) = 6y - 3y^2 + 3$ at y=1

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2. Find the value of the polynomial $f(y) = 6y - 3y^2 + 3$ at

$y = -1$

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3. Find the value of the polynomial $f(y) = 6y - 3y^2 + 3$ at

y=0

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4. If $p(x) = x^2 - 2\sqrt{2}x + 1$, find $p(2\sqrt{2})$.

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5. Find the zeros of the polynomial in each of the following :

$p(x) = x - 3$

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6. Find the zeros of the polynomial in each of the following :

$p(x) = 2x + 5$

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7. Find the zeros of the polynomial in each of the following :

$q(y) = 2y - 3$

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8. Find the zeros of the polynomial in each of the following :

$h(x) = ax + b, a \neq 0, a, b \in R$

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9. Find the roots of the polynomial equations .

$5x - 6 = 0$

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10. Find the roots of the polynomial equations .

$x + 3 = 0$

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11. Find the roots of the polynomial equations .

$10x + 9 = 0$

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12. Find the roots of the polynomial equations .

$9x - 4 = 0$

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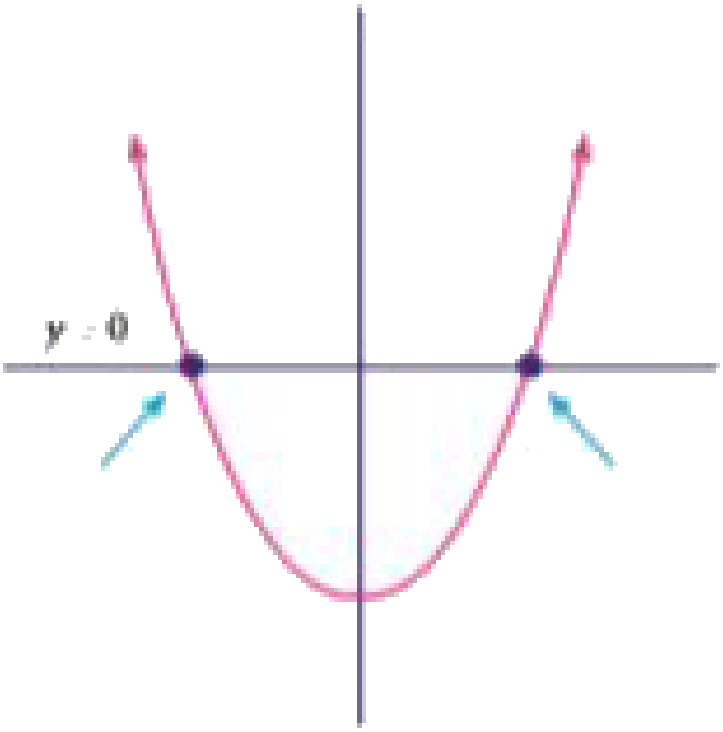
13. Find the number of zeros of the following polynomials represented by their graphs.



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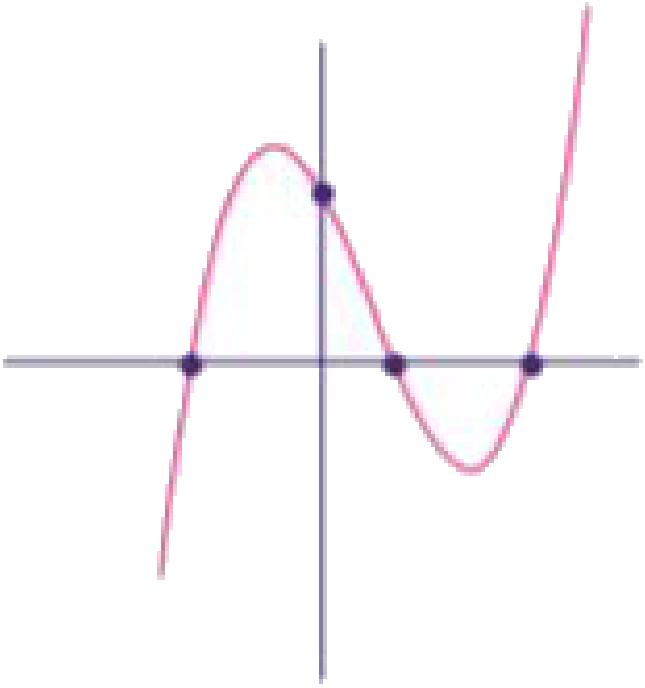
14. Find the number of zeros of the following polynomials represented by their graphs.



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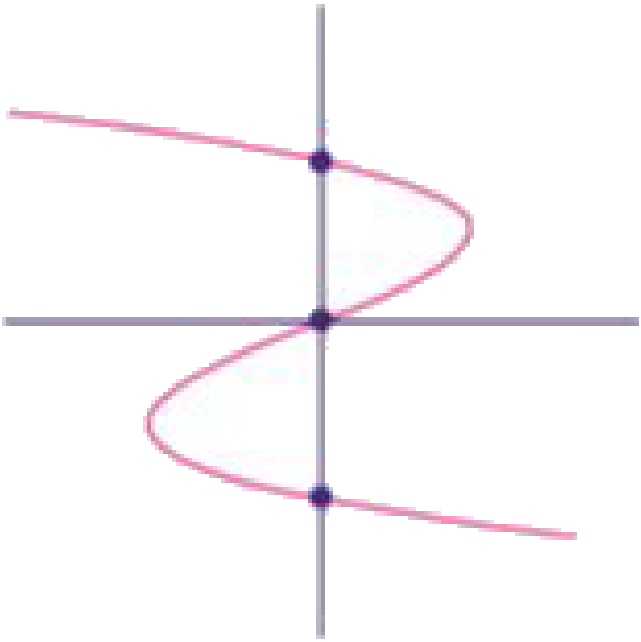

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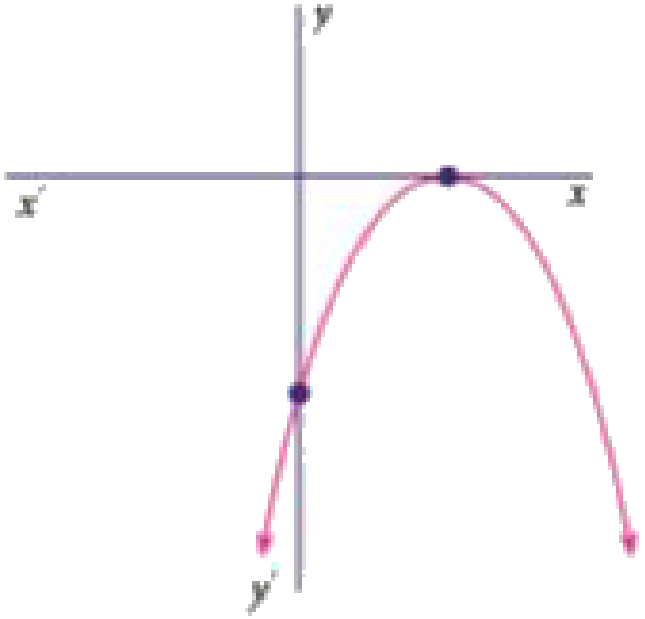

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Exercise 3 3

1. Check whether p(x) is a multiple of g(x) or not .

$p(x) = x^3 - 5x^2 + 4x - 3, g(x) = x - 2$

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2. By remainder theorem, find the remainder when, p(x) is divided by g(x) where,

$p(x) = 4x^3 - 12x^2 + 14x - 3, g(x) = 2x - 1$

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3. By remainder theorem, find the remainder when, p(x) is divided by g(x) where,

$p(x) = x^3 - 3x^2 + 4x + 50, g(x) = x - 3$

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4. Find the remainder when $3x^3 - 4x^2 + 7x - 5$ is divided by $(x + 3)$

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5. What is the remainder when $x^{2018} + 2018$ is divided by $x - 1$

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6. For what value of k is the polynomial $p(x) = 2x^3 - kx^2 + 3x + 10$ exactly divisible by $(x-2)$

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7. If two polynomials $2x^3 + ax^2 + 4x - 12$ and $x^3 + x^2 - 2x + a$ leave the same remainder when divided by $(x-3)$, find the value of a and also find the remainder.

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8. Determine whether $(x - 1)$ is a factor of the following polynomials:

$x^3 + 5x^2 - 10x + 4$

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9. Determine whether $(x-1)$ is a factor of the following polynomials:

x^4+5x^2-5x+1

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10. Using factor theorem, show that $(x-5)$is a factor of the polynomial $2x^3-5x^2-28x+15$

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11. Determine the value of m , if $(x+3)$ is a factor of $x^3-3x^2-mx+24.$

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12. If $(x-1)$ divides the polynomial $kx^3-2x^2+25x-26$ without remainder, then find the value of k .

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13. Check if $(x+2)$ and $(x-4)$ are the sides of a rectangle whose area is x^2-2x-8 by using factor theorem.

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Exercise 3 4

1. Expand the following:

$(x+2y+3z)^2$

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2. Expand the following:

$(-p+2q+3r)^2$

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3. Expand the following:

$(2p+3)(2p-4)(2p-5)$

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4. Expand the following:

$(3a+1)(3a-2)(3a+4)$

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5. Using algebraic identity, find the coefficients of x^2, x and constant term without actual expansion

$(x+5)(x+6)(x+8)$

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6. Using algebraic identity, find the coefficients of x^2, x and constant term without actual expansion

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

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7. If $(x+a)(x+b)(x+c) = x^3 + 14x^2 + 59x + 70$, find the value of $a+b+c$

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8. If $(x+a)(x+b)(x+c) = x^3 + 14x^2 + 59x + 70$, find the value of

$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}$

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9. If $(x+a)(x+b)(x+c)=x^3+14x^2+59x+70$, find the value of

$a^2+b^2+c^2$

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10. If $(x+a)(x+b)(x+c)=x^3+14x^2+59x+70$, find the value of

$\frac{a}{bc}+\frac{b}{ac}+\frac{c}{ab}$

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11. Expand: $(3a-4b)^3$

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12. Expand: $\left(x+\frac{1}{y}\right)^3$

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13. Evaluate the following by using identities:

98^3

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14. Evaluate the following by using identities:

1001^3

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15. If $(x+y+z)=9$ and $(xy+yz+zx)=26$, then find the value of $x^2+y^2+z^2$.

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16. Find $27a^3+64b^3$, If $3a+4b=10$ and $ab=2$.

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17. Find x^3-y^3, if $x-y=5$ and $xy=14$.

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18. If $a+\frac{1}{a}=6$, then find the value of $a^3+\frac{1}{a^3}$

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19. If $x^2 + \frac{1}{x^2} = 23$, then find the value of $x + \frac{1}{x}$ and $x^3 + \frac{1}{x^3}$

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20. If $\left(y - \frac{1}{y}\right) = 27$, then find the value of $y^3 - \frac{1}{y^3}$.

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21. Simplify: $(2a + 3b + 4c)\left(4a^2 + 9b^2 + 16c^2 - 6ab - 12bc - 8ca\right)$

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22. Simplify: $(x - 2y + 3z)\left(x^2 + 4y^2 + 9z^2 + 2xy + 6yz - 3xz\right)$

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23. By using identity evaluate the following:

$7^3 - 10^3 + 3^3$

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24. By using identity evaluate the following: $1 + \frac{1}{8} - \frac{27}{8}$

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25. If $2x - 3y - 4z = 0$, then find $8x^3 - 27y^3 - 64z^3$

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Exercise 3 5

1. Factorise the following expressions:

$2a^2 + 4a^2b + 8a^2c$

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2. Factorise the following expressions:

$ab - ac - mb + mc$

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3. Factorise the following:

$x^2 + 4x + 4$

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4. Factorise the following:

$3a^2 - 24ab + 48b^2$

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5. Factorise the following:

$x^5 - 16x$

View Text Solution

6. Factorise the following:

$m^2 + \frac{1}{m^2} - 23$

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7. Factorise the following:

$6 - 216x^2$

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8. Factorise the following:

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

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9. Factorise the following:

$$4x^2 + 9y^2 + 25z^2 + 12xy + 30yz + 20xz$$

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10. Factorise the following:

$$25x^2 + 4y^2 + 9z^2 - 20xy + 12yz - 30xz$$

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11. Factorise the following:

$$8x^3 + 125y^3$$

View Text Solution

12. Factorise the following:

$27x^3 - 8y^3$

View Text Solution

13. Factorise the following:

$a^6 - 64$

View Text Solution

14. Factorise the following:

$x^3 + 8y^3 6xy - 1$

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15. Factorise the following:

$l^3 - 8m^3 - 27n^3 - 18lmn$

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Exercise 3 6

1. Factorise the following:

$x^2 + 10x + 24$

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2. Factorise the following:

$z^2 + 4z - 12$

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3. Factorise the following:

$p^2 - 6p - 16$

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4. Factorise the following:

$t^2 + 72 - 17t$

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5. Factorise the following:

$y^2 - 16y - 80$

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6. Factorise the following:

$a^2 + 10a - 600$

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7. Factorise the following:

$2a^2 + 9a + 10$

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8. Factorise the following:

$5x^2 - 29xy - 42y^2$

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9. Factorise the following:

$9 - 18x + 8x^2$

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10. Factorise the following:

$6x^2 + 16xy + 8y^2$

View Text Solution

11. Factorise the following:

$12x^2 + 36x^2y + 27y^2x^2$

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12. Factorise the following:

$(a + b)^2 + 9(a + b) + 18$

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13. Factorise the following:

$(p - q)^2 - 6(p - q) - 16$

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14. Factorise the following:

$m^2 + 2mn - 24n^2$

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15. Factorise the following:

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

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16. Factorise the following:

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

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17. Factorise the following:

$8m^3 - 2m^2n - 15mn^2$

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18. Factorise the following:

$\frac{1}{x^2} + \frac{1}{y^2} + \frac{2}{xy}$

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Exercise 3 7

1. Find the quotient and remainder of the following

$\left(4x^3 + 6x^2 - 23x + 18\right) \div (x + 3)$

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2. Find the quotient and remainder of the following

$\left(8y^3 - 16y^2 + 16y - 15\right) \div (2y - 1)$

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3. Find the quotient and remainder of the following

$\left(8x^3 - 1\right) \div (2x - 1)$

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4. Find the quotient and remainder of the following

$\left(- 18z + 14z^2 + 24z^3 + 18\right) \div (3z + 4)$

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5. The area of a rectangle is $x^2 + 7x + 12$. If its breadth is $(x + 3)$, then find its length

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6. The base of a parallelogram is $(5x + 4)$. Find its height, if the area is $25x^2 - 16$

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7. The sum of (x+5) observations is $\left(x^3 + 125\right)$. Find the mean of the observations.

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8. Find the quotient and remainder for the following using synthetic division:

$\left(x^3 + x^2 - 7x - 3\right) \div (x - 3)$

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9. Find the quotient and remainder for the following using synthetic division:

$\left(x^3+2x^2-x-4\right) \div (x+2)$

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10. Find the quotient and remainder for the following using synthetic division:

$\left(3x^3-2x^2+7x-5\right) \div (x+3)$

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11. Find the quotient and remainder for the following using synthetic division:

$\left(8x^4-2x^2+6x+5\right) \div (4x+1)$

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12. If the quotient obtained on dividing $\left(8x^4 - 2x^2 + 6x - 7\right)$ by $(2x + 1)$ is $\left(4x^3 + px^2 - qx + 3\right)$. , then find p, q and also the remainder.

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13. If the quotient obtained on dividing $3x^3 + 11x^2 + 34x + 106$ by $x - 3$ is $3x^2 + ax + b$, then find a, b and also the remainder.

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Exercise 3 8

1. Factorise each of the following polynomials using synthetic division:

$x^3 - 3x^2 - 10x + 24$

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2. Factorise each of the following polynomials using synthetic division:

$2x^3 - 3x^2 - 3x + 2$

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3. Factorise each of the following polynomials using synthetic division:

$-7x + 3 + 4x^3$

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4. Factorise each of the following polynomials using synthetic division:

$x^3 + x^2 - 14x - 24$

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5. Factorise each of the following polynomials using synthetic division:

$x^3 - 7x + 6$

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6. Factorise each of the following polynomials using synthetic division:

$x^3 - 10x^2 - x + 10$

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Exercise 3 9

1. Find the GCD for the following:

p^5, p^{11}, p^9

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2. Find the GCD for the following:

$4x^3, y^3, z^3$

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3. Find the GCD for the following:

$9a^2b^2c^3, 15a^3b^2c^4$

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4. Find the GCD for the following:

$64x^8, 240x^6$

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5. Find the GCD for the following:

ab^2c^3, a^2b^3, a^3bc^2

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6. Find the GCD for the following:

$35x^5y^3z^4, 49x^2yz^3, 14xy^2z^2$

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7. Find the GCD for the following:

$25ab^3c, 100a^2bc, 125ab$

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8. Find the GCD for the following:

$3abc, 5xyz, 7pqr$

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9. Find the GCD for the following:

$(2x + 5), (5x + 2)$

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10. Find the GCD for the following:

$a^{m+1}, a^{m+2}, a^{m+3}$

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11. Find the GCD for the following:

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

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12. Find the GCD for the following:

$3a^2, 5b^3, 7c^4$

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13. Find the GCD for the following:

$x^4 - 1, x^2 - 1$

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14. Find the GCD for the following:

$a^3 - 9ax^2, (a - 3x)^2$

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Exercise 3 10

1. Draw the graph for the following

$y = 2x$

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2. Draw the graph for the following

$y = 4x - 1$

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3. Draw the graph for the following

$y = \left(\frac{3}{2}\right)x + 3$

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4. Draw the graph for the following

$3x + 2y = 14$

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5. Solve graphically

$x + y = 7, x - y = 3$

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6. Solve graphically

$3x + 2y = 4, 9x + 6y - 12 = 0$

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7. Solve graphically

$\frac{x}{2} + \frac{y}{4} = 1, \frac{x}{2} + \frac{y}{4} = 2$

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Exercise 3 11

1. Solve, using the method of substitution

$2x - 3y = 7, 5x + y = 9$

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2. Solve, using the method of substitution

$1.5x + 0.1y = 6.2, 3x - 0.4y = 11.2$

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3. Solve, using the method of substitution

$10\,\%$ of $x + 20\,\%$ of $y = 24, 3x - y = 20$

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4. Solve, using the method of substitution

$\sqrt{2}x - \sqrt{3}y = 1, \sqrt{3}x - \sqrt{8}y = 0$

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5. Raman's age is three times the sum of the ages of his two sons. After 5 years his age will be twice the sum of the ages of his two sons. Find the age of Raman.

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6. The middle digit of a number between 100 and 1000 is zero and the sum of the other digit is 13. If the digits are reversed, the number so formed exceeds the original number by 495. Find the number.

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Exercise 3 12

1. Solve by the method of elimination

$2x - y = 3, 3x + y = 7$

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2. Solve by the method of elimination

$x - y = 5, 3x + 2y = 25$

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3. Solve by the method of elimination

$\frac{x}{10} + \frac{y}{5} = 14, \frac{x}{8} + \frac{y}{6} = 15$

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4. Solve by the method of elimination

$3(2x + y) = 7xy, 3(x + 3y) = 11xy$

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5. Solve by the method of elimination

$\frac{4}{x} + 5y = 7, \frac{3}{x} + 4y = 5$

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6. Solve by the method of elimination

$13x + 11y = 70, 11x + 13y = 74$

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7. The monthly income of A and B are in the ratio 3:4 and their monthly expenditures are in the ratio 5:7. If each saves Rs 5,000 per month, find the monthly income of each.

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8. Five years ago, a man was seven times as old as his son, while five year hence, the man will be four times as old as his son. Find their present age.

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Exercise 3 13

1. Solve by cross-multiplication method

$8x - 3y = 12, 5x = 2y + 7$

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2. Solve by cross-multiplication method

$6x + 7y - 11 = 0, 5x + 2y = 13$

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3. Solve by cross-multiplication method

$$\frac{2}{x}+\frac{3}{y}=5, \frac{3}{x}-\frac{1}{y}+9=0$$

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4. Akshaya has 2 rupee coins and 5 rupee coins in her purse. If in all she has 80 coins totalling Rs220, how many coins of each kind does she have.

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5. It takes 24 hours to fi ll a swimming pool using two pipes. If the pipe of larger diameter is used for 8 hours and the pipe of the smaller diameter is used for 18 hours. Only half of the pool is fi lled. How long would each pipe take to fi ll the swimming pool.

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Exercise 3 14

1. The sum of a two digit number and the number formed by interchanging the digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sums of the digits of the first number. Find the first number.

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2. The sum of the numerator and denominator of a fraction is 12. If the denominator is increased by 3, the fraction becomes $\frac{1}{2}$. Find the fraction.

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3. ABCD is a cyclic quadrilateral such that $\angle A = (4y + 20^\circ, \angle B = (3y - 5)^\circ, \angle C = (4x)^\circ$ and $\angle D = (7x + 5)^\circ$

. Find the four angles.

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4. On selling a T.V. at 5% gain and a fridge at 10% gain, a shopkeeper gains Rs2000. But if he sells the T.V. at 10% gain and the fridge at 5% loss, he gains Rs.1500 on the transaction. Find the actual price of the T.V. and the fridge.

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5. Two numbers are in the ratio 5 : 6. If 8 is subtracted from each of the numbers, the ratio becomes 4 : 5. Find the numbers.

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6. 4 Indians and 4 Chinese can do a piece of work in 3 days. While 2 Indians and 5 Chinese can finish it in 4 days. How long would it take for 1 Indian to do it? How long would it take for 1 Chinese to do it?

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Exercise 3 15 Multiple Choice Questions

1. If $x^3 + 6x^2 + kx + 6$ is exactly divisible by $(x + 2)$, then k=?

A. -6

B. -7

C. -8

D. 11

Answer: D

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2. The root of the polynomial equation $2x + 3 = 0$ is

A. $\frac{1}{3}$

B. $-\frac{1}{3}$

C. $-\frac{3}{2}$

D. $-\frac{2}{3}$

Answer: C

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3. The type of the polynomial $4 - 3x^3$ is

A. constant polynomial

B. linear polynomial

C. quadratic polynomial

D. cubic polynomial.

Answer: D

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4. If $x^{51} + 51$ is divided by $x + 1$, then the remainder is

A. 0

B. 21

C. 49

D. 50

Answer: D

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5. Th e zero of the polynomial $2x + 5$ is

A. $\frac{5}{2}$

B. $-\frac{5}{2}$

C. $\frac{2}{5}$

D. $-\frac{2}{5}$

Answer: B

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6. The sum of the polynomials $p(x) = x^3 - x^2 - 2, q(x) = x^2 - 3x + 1$

A. $x^3 - 3x - 1$

B. $x^3 + 2x^2 - 1$

C. $x^3 - 2x^2 - 3x$

D. $x^3 - 2x^2 + 3x - 1$

Answer: A

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7. Degree of the polynomial $\left(y^3-2\right)\left(y^3+1\right)$ is

A. 9

B. 2

C. 3

D. 6

Answer: D

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8. Let the polynomials be

(A) $-13q^5+4q^2+12q$ (B) $\left(x^2+4\right)\left(x^2+9\right)$

(C) $4q^8 - q^6 + q^2$ (D) $-\frac{5}{7}y^{12} + y^3 + y^5$

Th en ascending order of their degree is

A. A,B,D,C

B. A,B,C,D

C. B,C,D,A

D. B,A,C,D

Answer: D

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9. If p(a)= 0 then $(x - a)$ is a ____of p(x)

A. divisor

B. quotient

C. remainder

D. factor

Answer: D

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10. Zeros of $(2-3x)$ is_____

A. 3

B. 2

C. $\frac{2}{3}$

D. $\frac{3}{2}$

Answer: C

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11. Which of the following has $x-1$ as a factor?

A. $2x-1$

B. $3x - 3$

C. $4x - 3$

D. $3x - 4$

Answer: B

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12. If $x - 3$ is a factor of p(x), then the remainder is

A. 3

B. -3

C. p(3)

D. $p(-3)$

Answer: C

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13. $(x+y)\left(x^2-xy+y^2\right)$ is equal to

A. $(x+y)^3$

B. $(x-y)^3$

C. x^3+y^3

D. x^3-y^3

Answer: C

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14. $(a+b-c)^2$ is equal to _____

A. $(a-b+c)^2$

B. $(-a-b+c)^2$

C. $(a+b+c)^2$

D. $(a-b-c)^2$

Answer: B

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15. If $(x+5)$ and $(x-3)$ are the factors of ax^2+bx+c, then values of a, b and c are

A. 1,2,3

B. 1,2,15

C. $1, 2, -15$

D. $1, -2, 15$

Answer: C

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16. Cubic polynomial may have maximum of _____ linear factors

A. 1

B. 2

C. 3

D. 4

Answer: C

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17. Degree of the constant polynomial is _____

A. 3

B. 2

C. 1

D. 0

Answer: D

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18. Find the value of m from the equation $2x + 3y = m$. If its one solution is x = 2 and $y = -2$.

A. 2

B. -2

C. 10

D. 0

Answer: B

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19. Which of the following is a linear equation

A. $x + \frac{1}{x} = 2$

B. $x(x - 1) = 2$

C. $3x + 5 = \frac{2}{3}$

D. $x^3 - x = 5$

Answer: C

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20. Which of the following is a solution of the equation $2x - y = 6$

A. (2,4)

B. (4,2)

C. $(3, -1)$

D. (0,6)

Answer: B

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21. If (2,3) is a solution of linear equation $2x + 3y = k$ then, the value of k is

A. 12

B. 6

C. 0

D. 13

Answer: D

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22. Which condition does not satisfy the linear equation $ax + by + c = 0$

A. $a \neq 0, b = 0$

B. $a = 0, b \neq 0$

C. $a = 0, b = 0, c \neq 0$

D. $a \neq 0, b \neq 0$

Answer: C

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23. Which of the following is not a linear equation in two variable

A. $ax + by + c = 0$

B. $0x + 0y + c = 0$

C. $0x + by + c = 0$

D. $ax + 0y + c = 0$

Answer: B

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24. The value of k for which the pair of linear equations $4x + 6y - 1 = 0$ and $2x + ky - 7 = 0$ represents parallel lines is

A. k=3

B. k=2

C. k=4

D. $k = -3$

Answer: A

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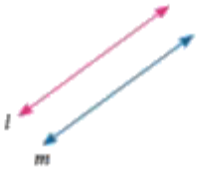
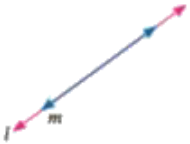
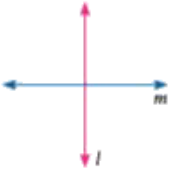
25. A pair of linear equations has no solution then the graphical representation is

A. 

B. 

C. 

D. 

Answer: B

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26. If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ then the given pair of linear equation has _____ solution(s)

A. no solution

B. two solutions

C. unique

D. infinite

Answer: C

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27. If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ where $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ then the given pair of linear equation has _____ solution(s)

A. no solution

B. two solutions

C. infinite

D. unique

Answer: A

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28. GCD of any two prime numbers is _____

A. -1

B. 0

C. 1

D. 2

Answer: C

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29. The GCD of $x^4 - y^4$ and $x^2 - y^2$ is

A. $x^4 - y^4$

B. $x^2 - y^2$

C. $(x + y)^2$

D. $(x + y)^4$

Answer: B

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