MATHS

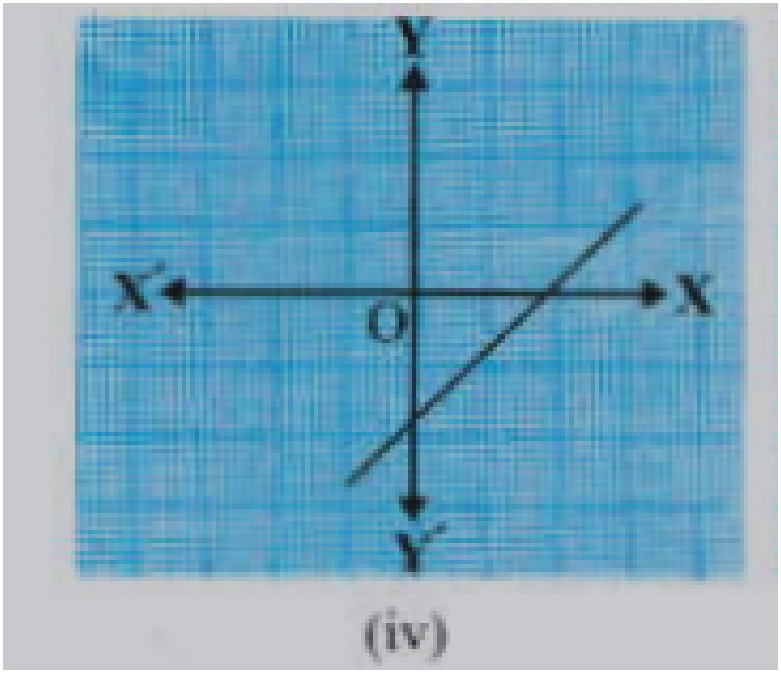
BOOKS - PSEB

POLYCNOMIALS

Example

1. In general, given a polynomial p(x) of degree n, the graph of y = p(x) intersects the x-axis atmost n points. Therefore, a polynomial p(x)

of degree n has atmost n zeroes:



(iv)

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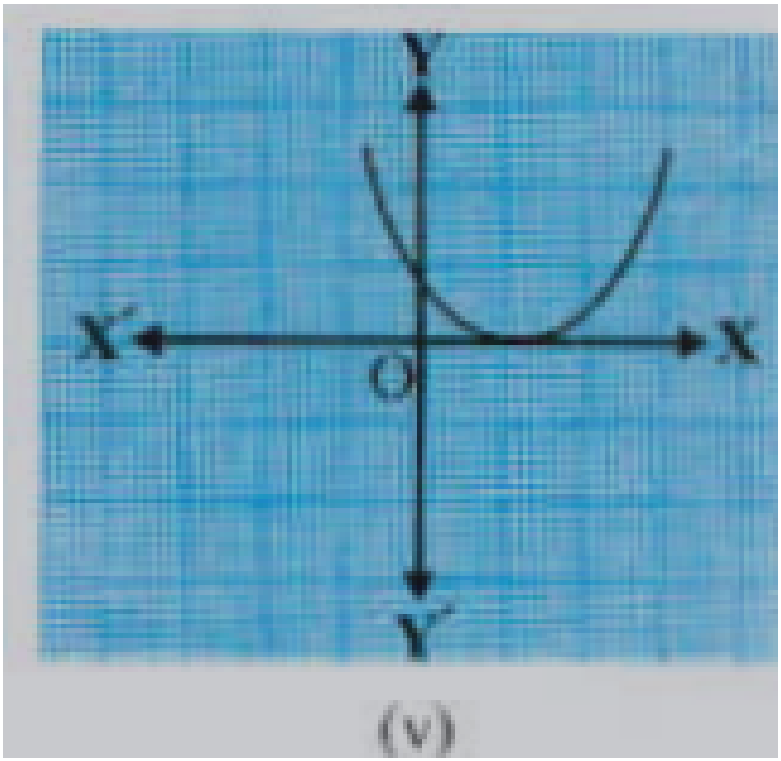
2. find the number of zeroes:



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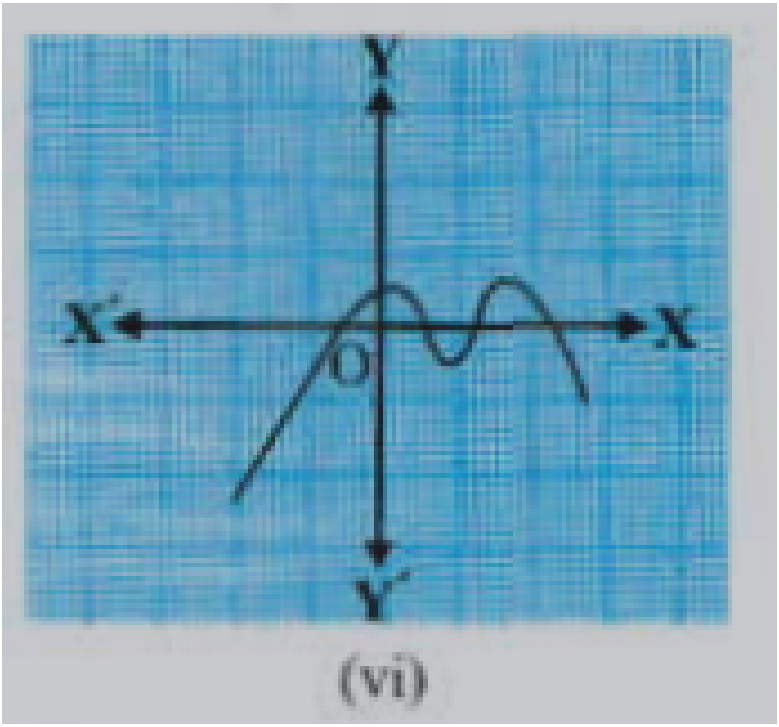
3. In general, given a polynomial pix) of degree n, the graph of y = p(x) intersects the x-axis at utmost n points. Therefore, a polynomial p(.r) of degree n has at most n zeroes:



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4. The graphs of y = p(x) arc giver in Fig. 2.10 below, for some polynomials p(x). Find the number of zeroes of p(x),in each ease

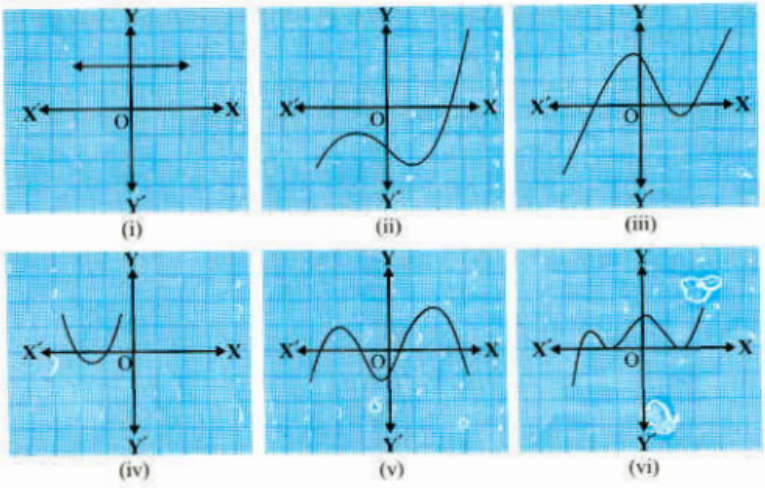

Fig. 2.10

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5. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $x^2 + 7x + 10$.

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6. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $x^2 - 3$.

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7. Find a quadratic polynomial each with the given number as the sum and product of its zeroes respectively. : -3,2

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8. Verify that $3, -1, -\frac{1}{3}$ are the zeroes of the cubic polynomial $p(x) = 3x^3 - 5x^2 - 11x - 3$ and then verify

the relationship between the zeroes and the coefficients.

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9. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $x^2 - 2x - 8$.

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10. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $4s^2 - 4s + 1$.

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11. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $6x^2 - 3 - 7x$.

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12. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $4u^2 + 8u$.

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13. Find the zeroes of the following quadratic polynomials and verify the relationship

between the zeroes and the coefficients. : $t^2 - 15$.

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14. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $3x^2 - x - 4$.

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15. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively. : $\frac{1}{4}, -1$.

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16. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively. : $\sqrt{2}, \frac{1}{3}$.

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17. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively. : $0, \sqrt{5}$.

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18. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively. : 1,1

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19. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively. : -1/4,1/4 .

20. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively. : 4,1 .

21. Divide $2x^2 + 3x + 1byx + 2.$

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22. Apply the division algorithm to find quotient and remainder on dividing p (x) by g (x) as given below :

$p(x) = 3x^3 + x^2 + 2x + 5, g(x)1 + 2x + x^2$

.

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23. Divide $3x^2 - x^3 - 3x + 5byx - 1 - x^2$, and verify the division algorithm.

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24. Find all the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$ if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

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25. Apply the division algorithm to find the quotient and remainder on dividing p (x) by g (x) as given below :

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

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26. Apply the division algorithm to find the quotient and remainder on dividing p (x) by g (x) as given below :

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

.

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27. Apply the division algorithm to find the quotient and remainder on dividing p (x) by g (x) as given below :

$p(x) = x^4 - 5x + 6, g(x) = 2 - x^2$,

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28. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm : $t^2 - 3, 2t^4 + 3t^3 - 2t^2 - 9t - 12$.

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29. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm : $x^2 + 3x + 1, 3x^4 + 5x^3 - 7x^2 + 2x + 2$.

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30. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm : $x^3 - 3x + 1, x^5 - 4x^3 + x^2 + 3x + 1$.

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31. Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$ if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.

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32. On dividing $x^3 - 3x^2 + x + 2$ by a polynomial g (x), the quotient and remainder were x - 2 and - 2x + 4 respectively find g (x).

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33. Give examples of polynomials p (x), g (x), q (x) and r (x), which satisfy the division algorithm and : deg p (x) = deg q (x) .

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34. Give examples of polynomials p (x), g (x), q (x) and r (x), which satisfy the division algorithm and : deg p (x) = deg q (x) .

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35. Give examples of polynomials p (x), g (x), q (x) and r (x), which satisfy the division algorithm and : deg r (x) = 0 .

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36. Verify that the number given alongside of the cubic polynomials below are their zeroes. Also verify the relationship between the zeroes . and the coefficients in each case : $2x^3 + x^2 - 5x + 2, \frac{1}{2}, 1, -2$.

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37. Verify that the numbers given alongside of the cubic polynomials below are their zeroes,

Also verify the relationship between the zeroes and the coefficients in each ease: $x^3 + 4x^2 - 5x + 2, 2, 1, 1$

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38. Find a cubic polynomial with the sum, sum of the product of its zeroes taken two at a time, and the product of its zeroes as 2, - 7, - 14 respectively.

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39. If the zeroes of the polynomial $x^3 - 3x^2 + x + 1$ are a -b , a, a + b, find a and b .

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40. If two zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find other zeroes.

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41. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be x+a, find k and a.

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