MATHS

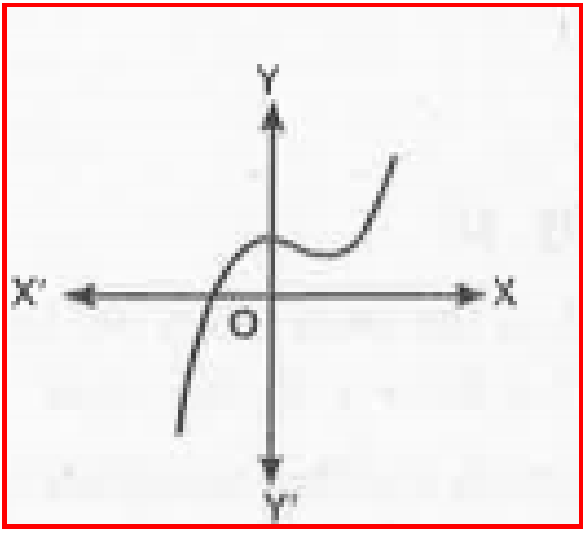
BOOKS - MBD

POLYNOMIALS

Example

1. Look at the graph in Fig. IV given below. Each is the graph of y = p (x). where p (x) is a polynomial. For each of the graph, find the number of zeroes

of p (x)



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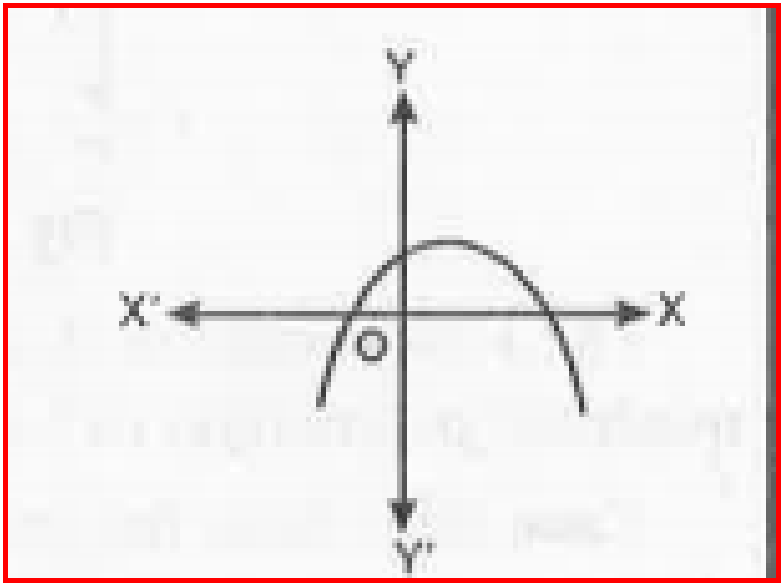

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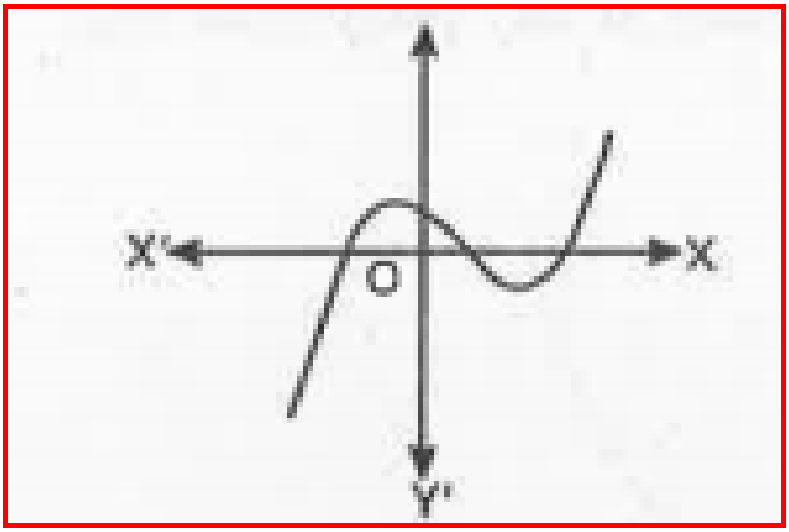

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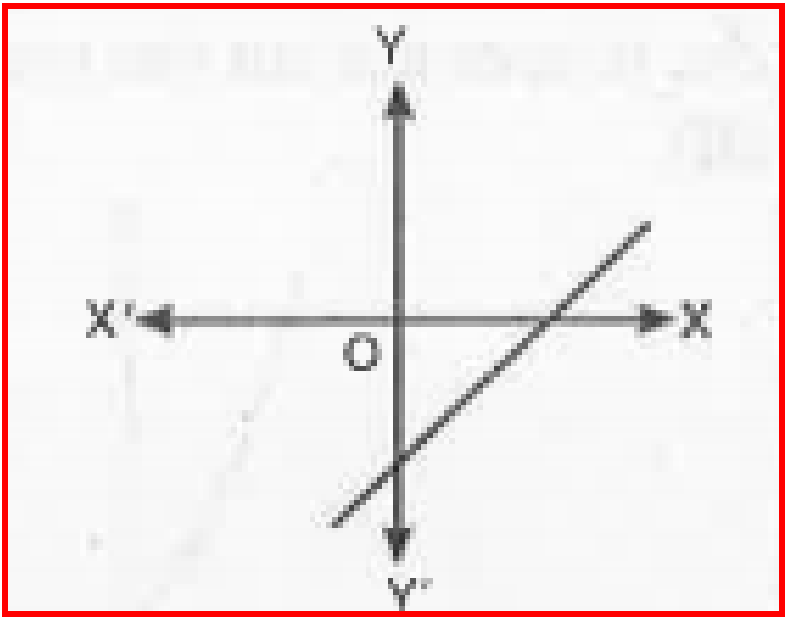

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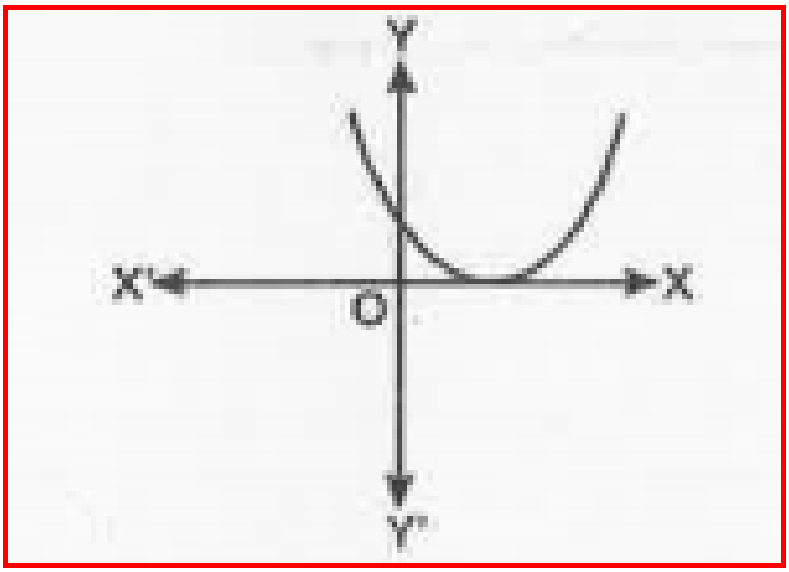

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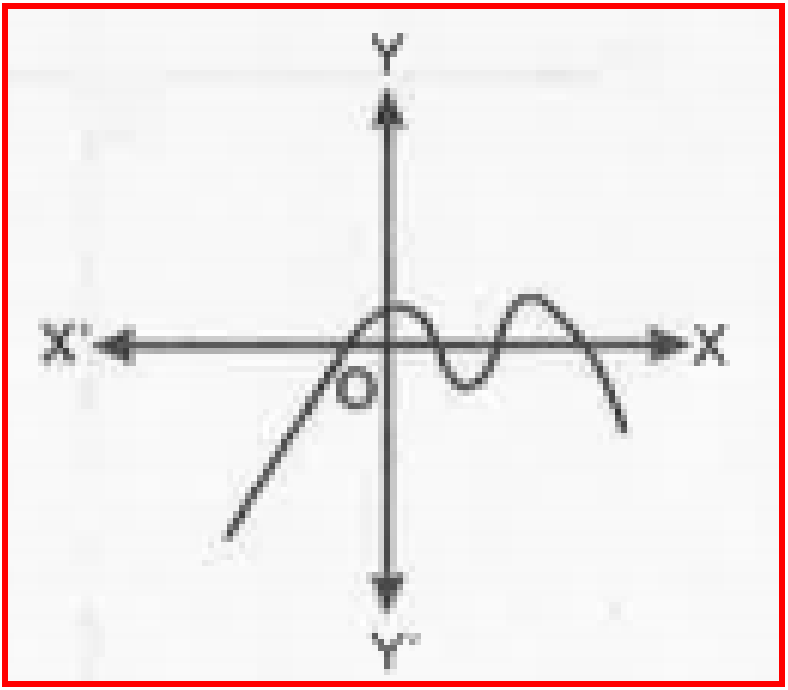

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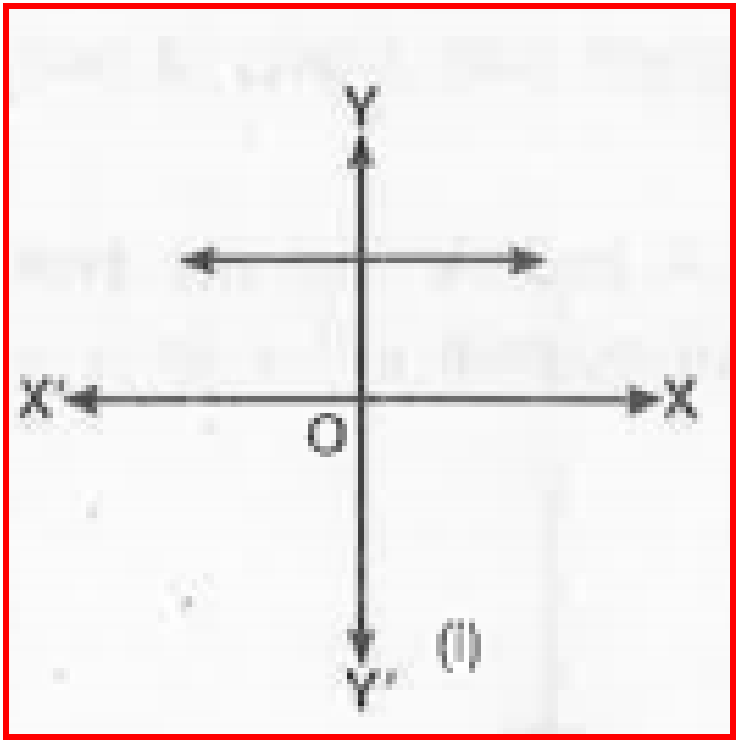
7. The graphs of y - p (x) are given in Fig. below, for some polynomials p(x). Find the number of zeroes

of p (x), in each case.



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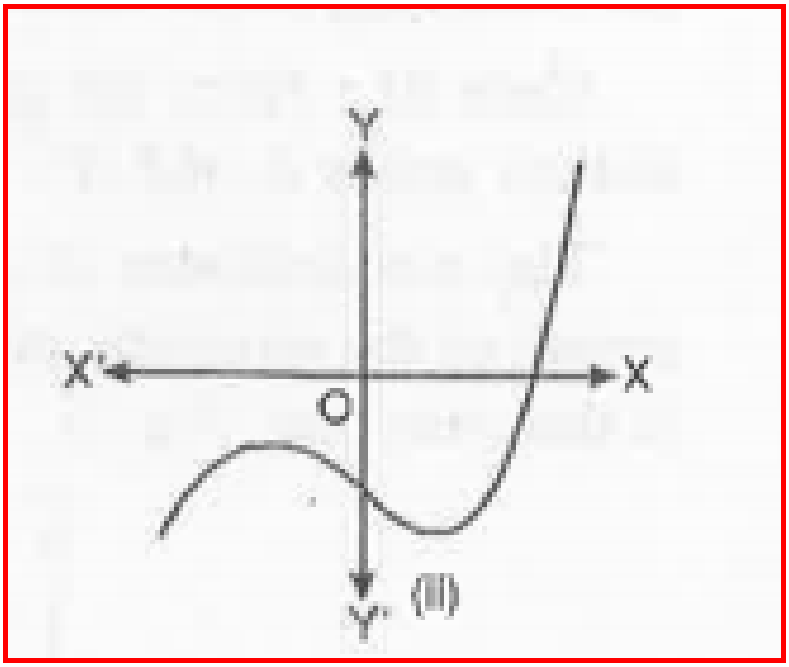

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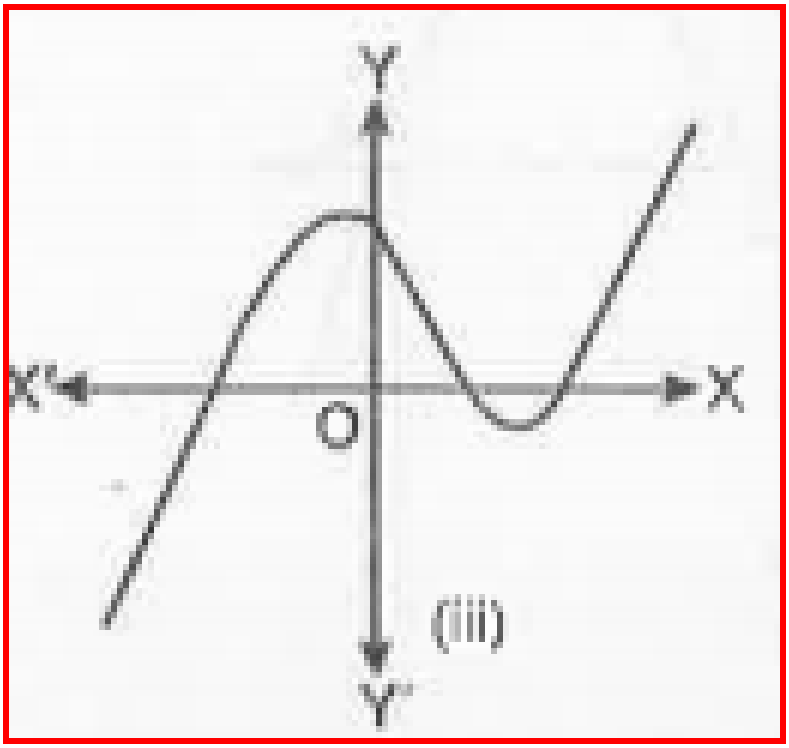

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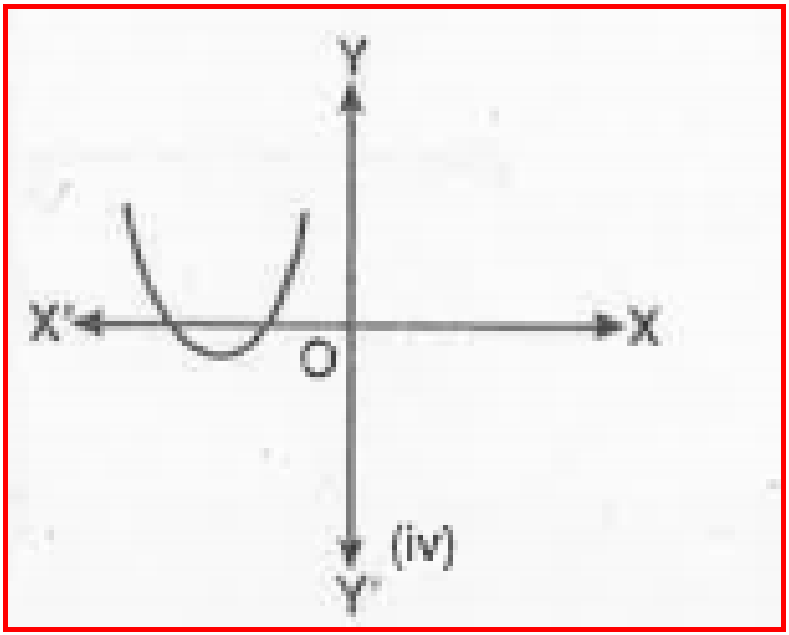

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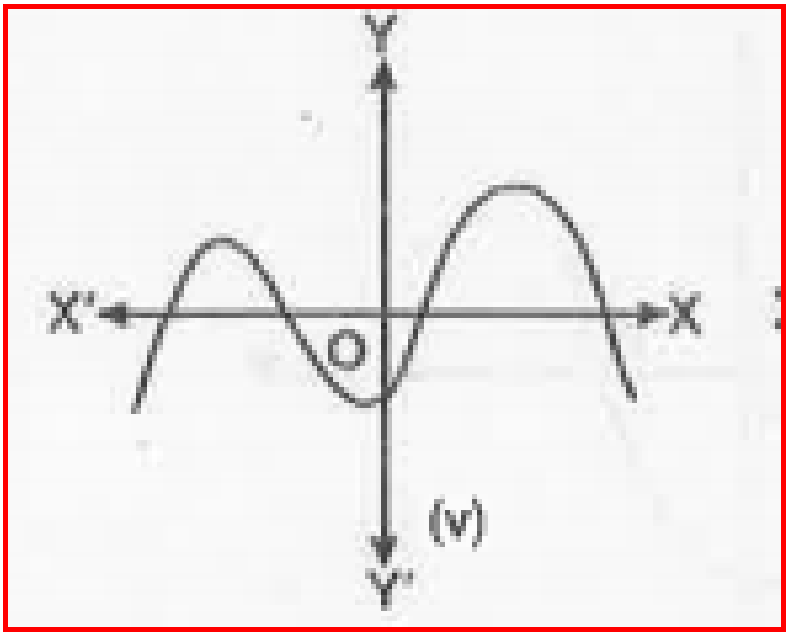

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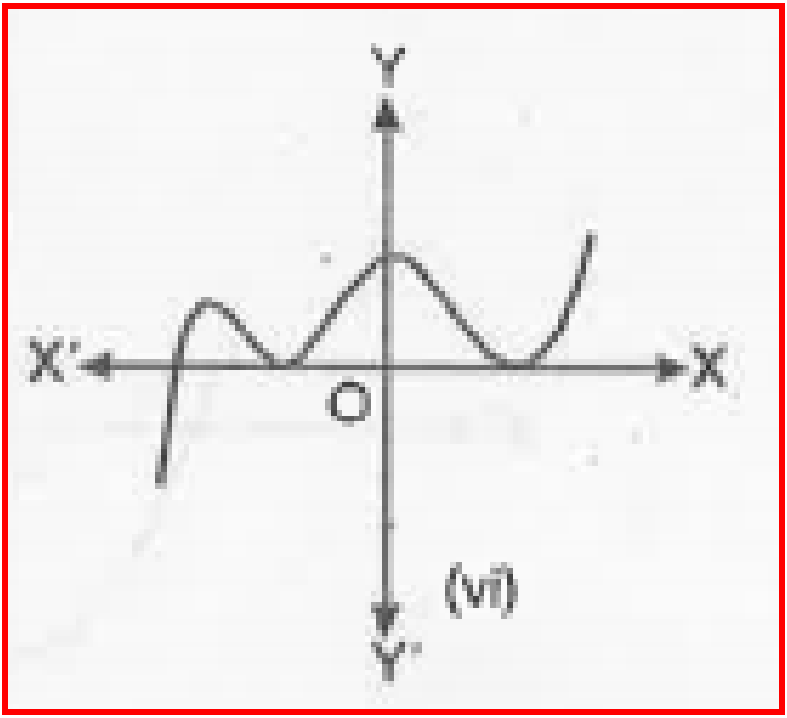

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13. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $x^2 - 2x - 8$.

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14. 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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15. 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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16. 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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17. 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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18. 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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19. 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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20. 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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21. 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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22. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively. : 1,1

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

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

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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 .

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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 r (x) = 0 .

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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 p (x) = deg q (x) .

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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 number given alongside of the cubic polynomials below are their zeroes. Also verify the relationship between the zeroes . and the coefficients in each case : $x^3 + 4x^2 + 5x - 2, 2, 1, 1$.

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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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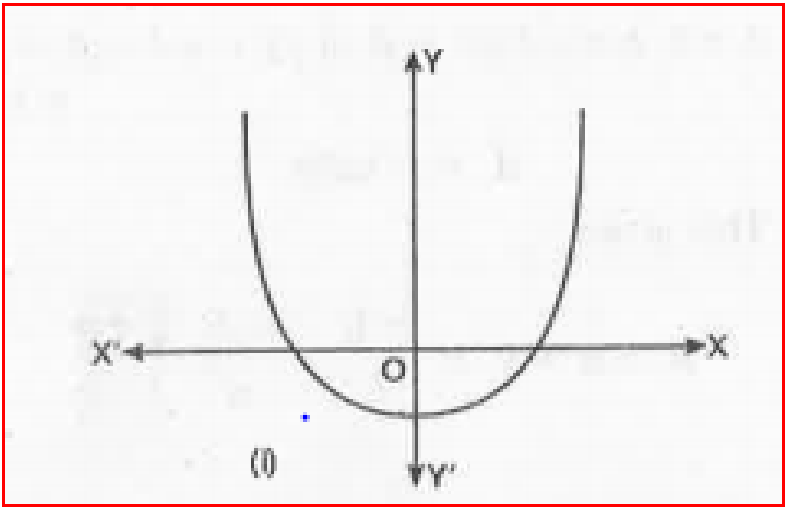
Exercise

1. The graphs of y = p (x) are given in figure below, for some polynomials p (x). Find the number of zeroes of p (x), in each case.



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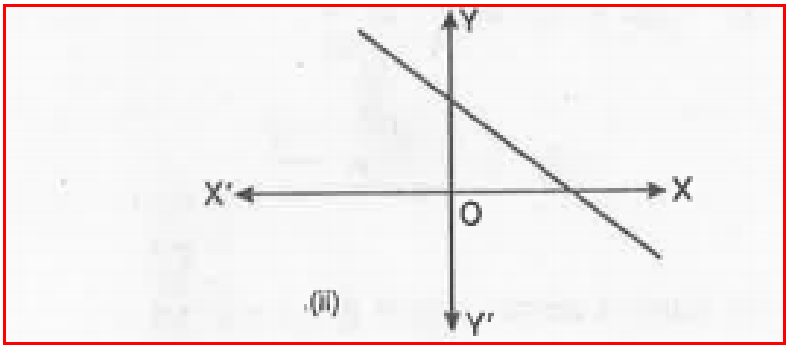

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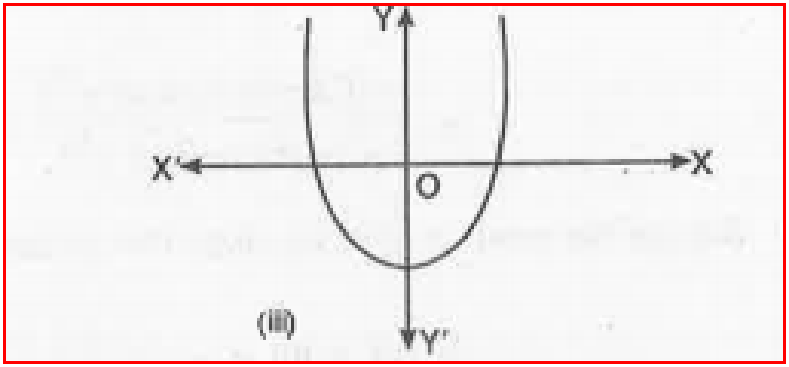

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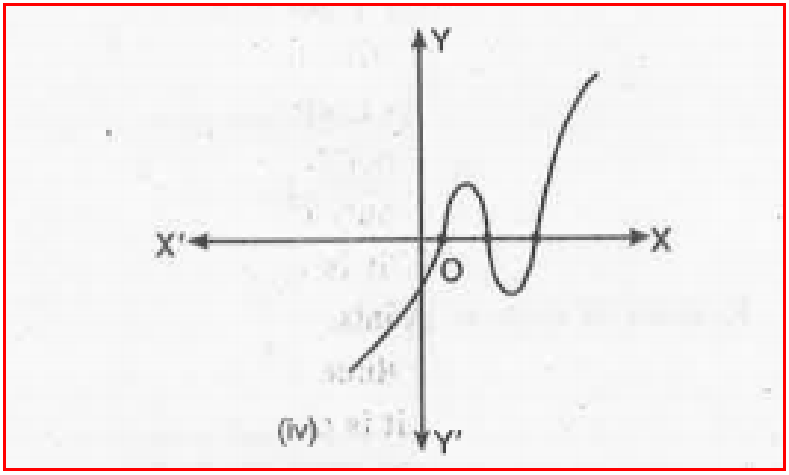

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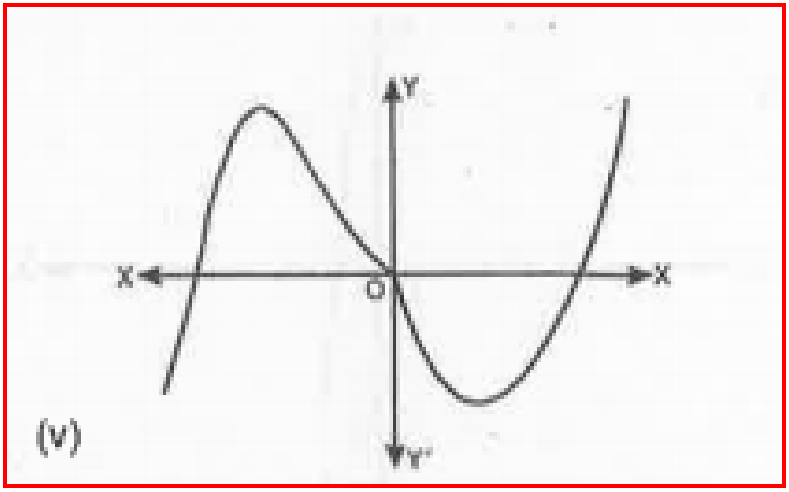

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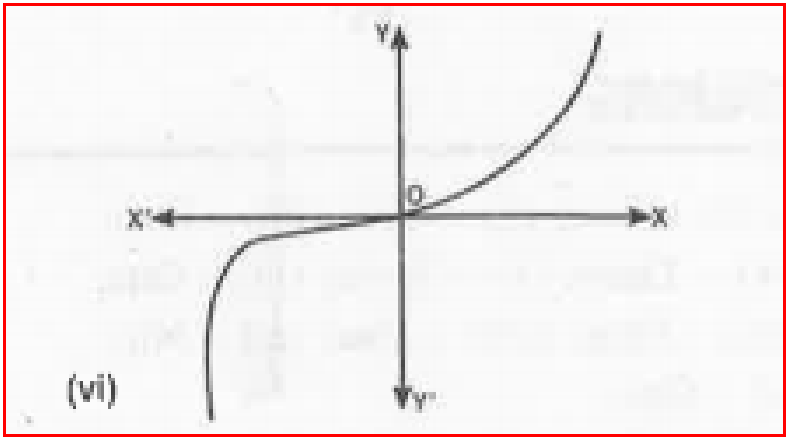

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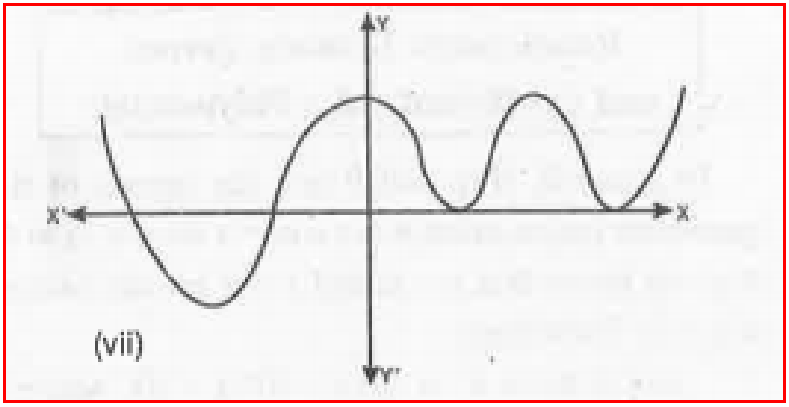

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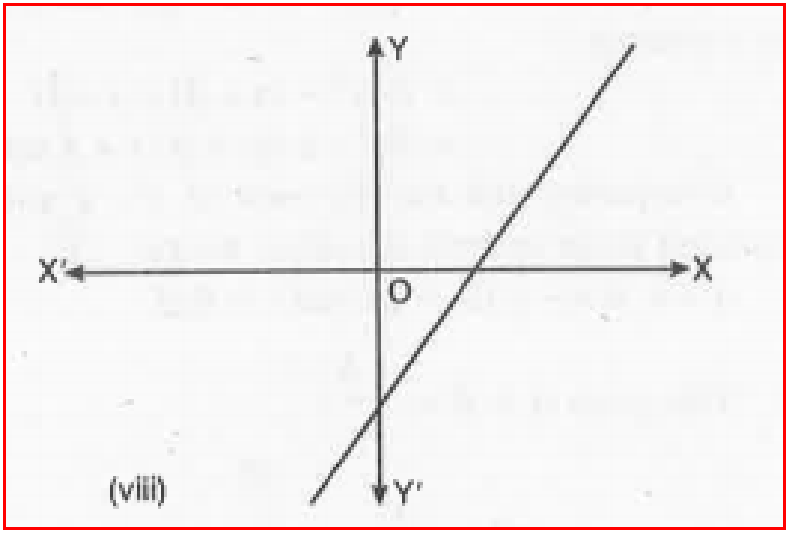

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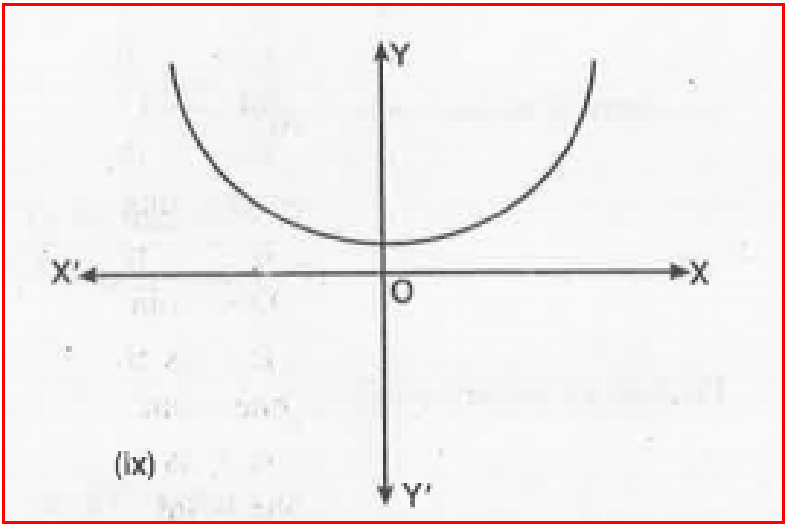

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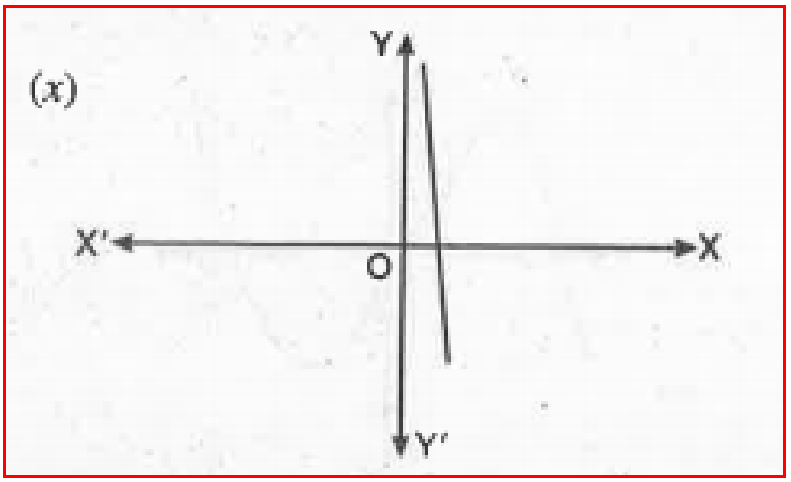

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11. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $2x^2 - 8x + 6$.

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12. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $3x^2 + 5x - 2$.

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13. 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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14. 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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15. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. : $x^2 + 2\sqrt{2}x - 6$.

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16. Find a quadratic polynomial each with the given number as the sum and product of its zeroes respectively. : 2/3,(-1)/3 .

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

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18. Find a quadratic polynomial each with the given number as the sum and product of its zeroes respectively. : -a, (-1)/a .

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

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

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

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22. Find the zeroes of the following cubic polynomials and verify the relationship between the zeroes and the coefficients. : $2x^3 - 5x^2 - 14x + 8$ '

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23. Find the zeroes of the following cubic polynomials and verify the relationship between the zeroes and the coefficients. : $x^3 - 4x^2 + 5x - 2$.

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24. Find the zeroes of the following cubic polynomials and verify the relationship between the zeroes and the coefficients. : $2x^3 + x^2 - 5x + 2$.

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25. Find the zeroes of the following cubic polynomials and verify the relationship between the zeroes and the coefficients. : $x^3 - 2x^2 - x + 2$.

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26. Find the zeroes of the following cubic polynomials and verify the relationship between the zeroes and the coefficients. : $x^3 - 4x^2 + x + 6$.

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27. Verify that the numbers given alongside the cubic polynomials below are their zeroes. Also verify the relationship between the zeroes and the

coefficientsin each case. :

$2x^3 - 3x^2 - 17x + 30, \ -3, 2, \frac{5}{2}$.

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28. Verify that the numbers given alongside the cubic polynomials below are their zeroes. Also verify the relationship between the zeroes and the coefficients in each case. : $x^3 - 6x^2 + 11x - 6,$; $1, 2, 3.$

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29. Verify that the numbers given alongside the cubic polynomials below are their zeroes. Also verify the relationship between the zeroes and the coefficientsin each case. : $x^3 + 13x^2 + 32x + 20$, -1, -2, -10 .

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

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

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31. Apply the division algorithm to find quotient and remainder on dividing p (x) by g (x) as given below : $p(x) = y^3 + y^2 + 2y + 3, g(x) = y + 2$.

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32. Apply the division algorithm to find quotient and remainder on dividing p (x) by g (x) as given below : $p(x) = 2x^4 + x^3 - 14x^2 - 15x - 8$, $g(x) = x^2 + 3x + 2$.

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

$p(x) = x^3 - 6x^2 + 2x - 4, g(x) = x - 1$.

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34. Apply the division algorithm to find quotient and remainder on dividing p (x) by g (x) as given below : $p(x) = 2x^2 + 3x + 1, g(x) = x + 2$.

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35. 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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36. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm :

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

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37. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm :

$g(x) = x^2 - 3x + 2, p(x) 2x^4 - 6x^3 + 3x^2 + 3x - 2$

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38. Check whether the first polynomial is a factor of the second polynomial by applying the division

algorithm :

$g(x) = 3x - 2, p(x) = 3x^3 + x^2 - 20x + 12$.

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39. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm :

$g(y) = y^2 - 3y + 2, p(y) = y^3 - 6y^2 + 11y - 6$.

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40. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm :

$g(t) = t^3 + 3t + 2, p(t) = 2t^4 + t^3 - 14t^2 - 19t - 6$

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41. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm :

$g(x) = 3x + 10, p(x) = 9x^3 - 27x^2 - 100x + 300$

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42. Check whether the first polynomial is a factor of the second polynomial by applying the division algorithm :

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

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43. Obtain all other zeroes of $t^3 - 3t^2 - 10t + 24$ if twoof its zeroes are 2and-3.

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44. Obtain all other zeroes of $y^4 + y^3 - 7y^2 - y + 6$ if two of its zeroes are 1 and - 1.

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45. Obtain all other zeroes of $2z^4 + z^3 - 14z^2 - 19z - 6$ if two of its zeroes are -1 and -2 .

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46. Obtain all other zeroes of $y^4 + 10y^3 + 35y^2 + 50y + 24$ if two of its zeroes are -1 and -3 .

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47. 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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48. Find all the zeroes of given polynomial if their other zeroes are given alongside of the polynomials : $t^3 + 6t^2 + 11t + 6, \ -1$.

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49. Find all the zeroes of given polynomial if their other zeroes are given alongside of the polynomials : $y^4 - 7y^3 + 9y^2 + 7y - 10, 2, 5$.

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50. Find all the zeroes of given polynomial if their other zeroes are given alongside of the polynomials : $x^3 - 2x^2 - 29x - 42, 7$.

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51. Find all the zeroes of given polynomial if their other zeroes are given alongside of the polynomials : $2x^4 - 7x^3 - 13x^2 + 63x - 45, 1, 3$

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