MATHS

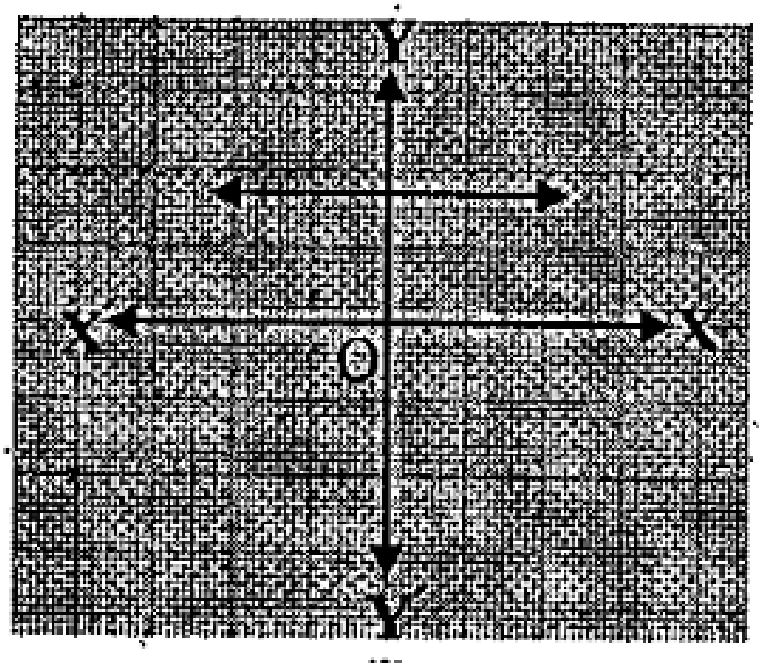
BOOKS - R G PUBLICATION

POLYNOMIALS

Exercise

1. The graphs of y=P(x) are given below,for some polynomials P(x).Find the number of

zeroes of P(x),in each case.



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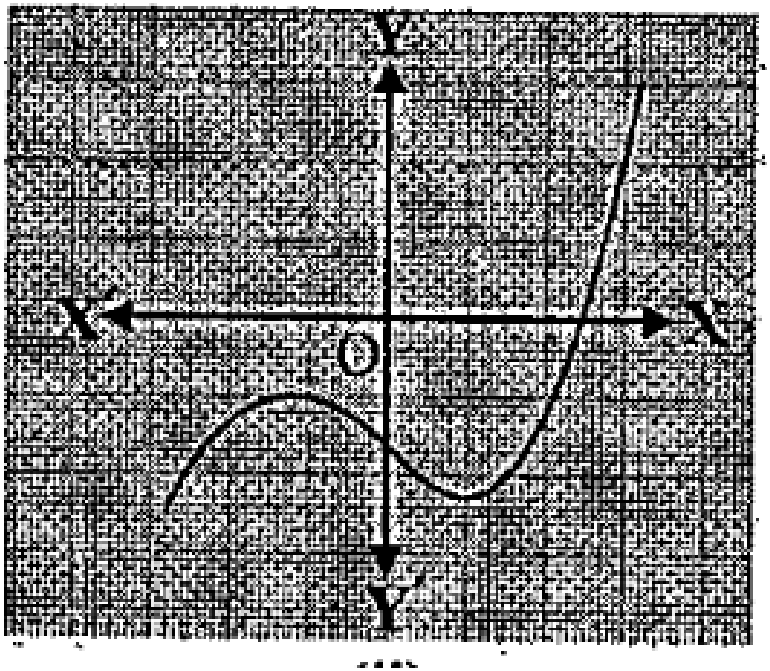

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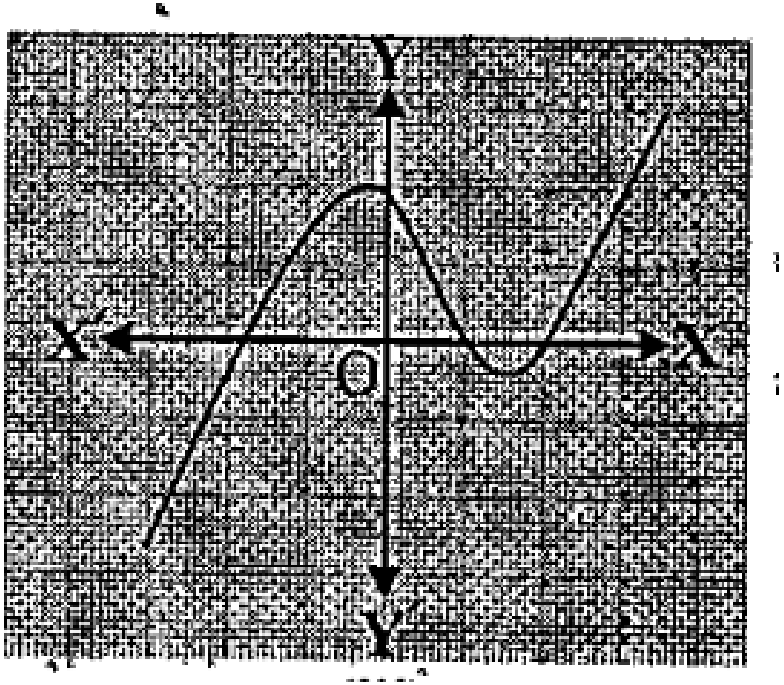
3. The graphs of y=P(x) are given in Fig.2.10 below,for some polynomials P(x).Find the

number of zeroes of P(x),in each case.



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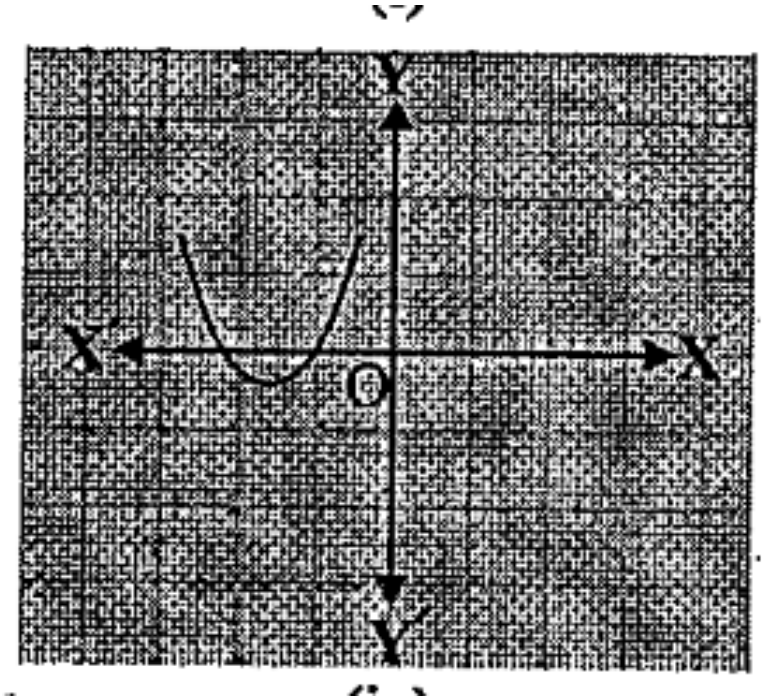

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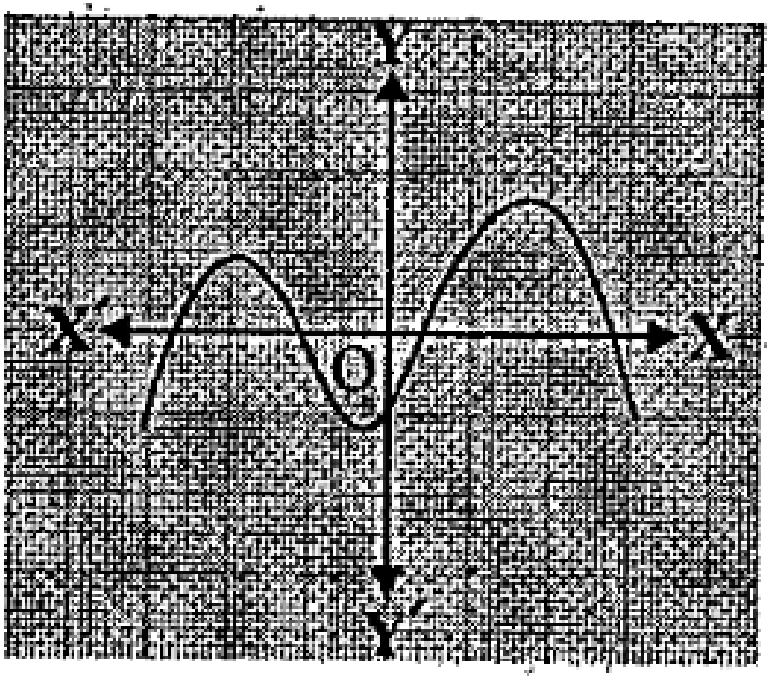

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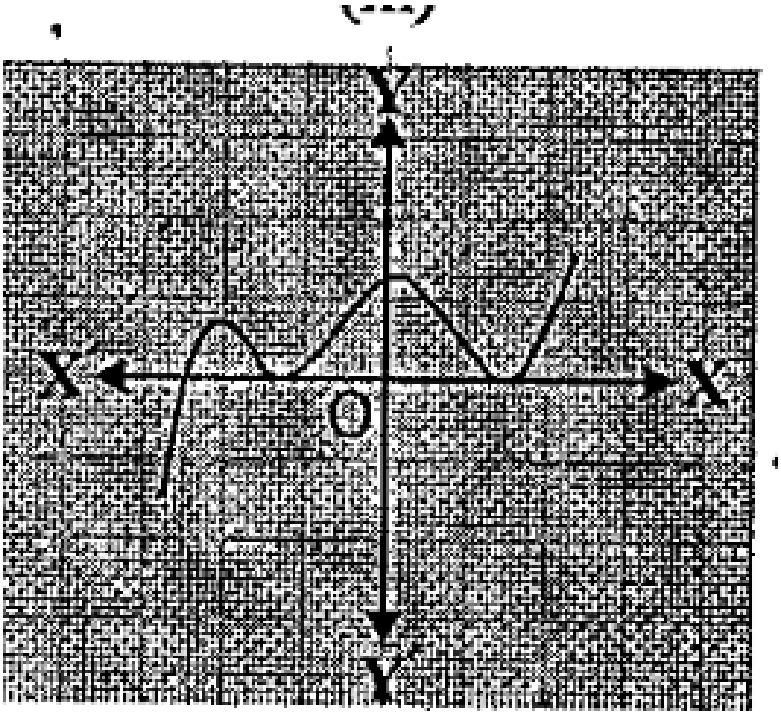

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7. Find the zeroes of the following quadratic polynomials and verify the relationship

between the zeroes and the coefficients:(i)

$x^2 - 2x - 8$

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8. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients:(ii)

$4s^2 - 4s + 1$

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

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

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11. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients:(v) $t^2 - 15$

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

between the zeroes and the coefficients:(vi) $3x^3 - x - 4$

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

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

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

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

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

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

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19. Divide the polynomial p(x) by the polynomial g(x) and find the quotient and remainder in each of the following:(i) `p(x)=x^3-3x^2+5x-3,g(x)=x^2-2

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20. Divide the polynomial p(x) by the polynomial g(x) and find the quotient and remainder in each of the following:(ii)

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

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21. Divide the polynomial p(x) by the polynomial g(x) and find the quotient and remainder in each of the following:(iii)

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

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22. Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial:

(i) $t^2 - 3, 2t^4 + 3t^3 - 2t^2 - 9t - 12$

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23. Check whether the first polynomial is a factor of the second polynomial by dividing

the second polynomial by the first polynomial:

(ii)$x^2 + 3x + 1, 3x^4 + 5x^3 - 7x^2 + 2x + 2$

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24. Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial:

(iii)$x^3 - 3x + 1, x^5 - 4x^3 + x^2 + 3x + 1$

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25. Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$

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26. 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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27. Give examples of polynomials p(x),g(x),q(x) and r(x),which satisfy the division algorithm and (i) degp(x)=degq(x)

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

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

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30. Verify that the numbers given along side of the cubic polynomial below are their zeroes.Also verify the relationship between the zeroes and the coefficients in each case:(i) $2x^3 + x^2 - 5x + 2, \frac{1}{2}, 1, -2$

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31. Verify that the numbers given along side of the cubic polynomial below are their zeroes.Also verify the relationship between the zeroes and the coefficients in each case:(ii) $x^3 - 4x^2 + 5x - 2$, 2,1,1

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32. 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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33. 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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34. 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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35. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$,the ramainder comes out to be x+a,find k and a.

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36. If α, β are the zeroes of the polynomial $f(x) = x^2 + x + 1$ then $\frac{1}{\alpha} + \frac{1}{\beta}$ is____

A. 0

B. -1

C. 1

D. None of these

Answer:

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37. The polynomial is

A. $\sqrt{x} + \frac{1}{\sqrt{x}}$

B. $x^2 - 5x + 6\sqrt{x} + 3$

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

D. None of these

Answer:

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38. The zeros of the polynomial $x^2 - \sqrt{2}x - 12$ are

a) $3\sqrt{2}, 2\sqrt{2}$ b) $\sqrt{2}, -\sqrt{2}$ c) $3\sqrt{2}, -2\sqrt{2}$ d) $-3\sqrt{2}, 2\sqrt{2}$

A. $3\sqrt{2}, 2\sqrt{2}$

B. $\sqrt{2}, -\sqrt{2}$

C. $3\sqrt{2}, -2\sqrt{2}$

D. $-3\sqrt{2}, 2\sqrt{2}$

Answer:

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39. The zeros of the quadratic polynomial $x^2 + 99x + 127$ are

a)equal b)positive c)Negative d)One positive and one negative

A. equal

B. positive

C. Negative

D. One positive and one negative

Answer:

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40. The zeros of the quadratic polynomial $x^2 + 88x + 125$ are

A. Positive

B. Negative

C. equal

D. One positive and one negative

Answer:

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41. If $p(x) = ax^2 + bx + c$ has no real zeroes and a+b+c<0,then

A. Cgt0

B. C=0

C. Clt0

D. None of these

Answer:

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42. If the zeroes of the quadratic polynomial $ax^2 + bx + c$,where $a \neq 0$and $c \neq 0$ are equal then

A. c and a have the same sign

B. c and b have the same sign

C. c and a have opposite sign

D. c and have opposite sign

Answer:

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43. If one of the zeroes of the quadratic polynomial $x^2 + bx + c$is negative of the other,then

a) b=0 and c is negative b) b=0 and c is positive c)$b \neq 0$ and c is positive d) $b \neq 0$ and c is negative

A. b=0 and c is negative

B. b=0 and c is positive

C. $b \neq 0$ and $cispositive$

D. `b!=0 and c is negative

Answer:

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44. If one zero of the quadratic polynomial $kx^2 + 3x + k$is 2,then the value of k is

A. $\frac{6}{5}$

B. $\frac{5}{6}$

C. $(-6\frac{)}{5}$

D. $\frac{-5}{6}$

Answer:

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45. If -4 is a zero of the polynomial `x^2-x-x-(2+2k) then the value of k is

A. 6

B. 3

C. 9

D. -9

Answer:

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46. If one zero of the polynomial $(k-1)x^2 + kx + 1$ is -4,then the value of k is

A. $\frac{4}{3}$

B. $\frac{-4}{3}$

C. $\frac{5}{4}$

D. $\frac{-5}{4}$

Answer:

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47. If one zero of $3x^2 + 8x + k$be the reciprocal of the other then the value of k is

a)3 b)-3 c)$\frac{1}{3}$ d)$\frac{-1}{3}$

A. 3

B. -3

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

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

Answer:

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48. If one zero of the polynomial $P(x) = \left(k^2 + 4\right)x^2 + 13x + 4k$,is reciprocal

of the other then the value of k is

a)1 b)2 c)-2 d)-1

A. 1

B. 2

C. -2

D. -1

Answer:

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49. If the polynomial $f(x) = ax^3 + bx - c$ is divisible by $g(x) = x^2 + bx + c$,then the value of ab is

A. 1

B. -1

C. 1/c

D. $\frac{-1}{c}$

Answer:

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50. If α, β are the zeroes of $f(x) = 2x^2 + 6x - 6$,then

a)$\alpha + \beta + \alpha\beta = 0$ b)$\alpha + \beta = \alpha\beta$ c) $\alpha + \beta > \alpha\beta$ d)$\alpha + \beta < \alpha\beta$

A. $\alpha + \beta + \alpha\beta = 0$

B. $\alpha + \beta = \alpha\beta$

C. $\alpha + \beta > \alpha\beta$

D. $\alpha + \beta < \alpha\beta$

Answer:

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51. If α, β are the zeroes of $2x^2 + 5x - 9$,then the value of $\alpha \cdot \beta$ is

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

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

C. $\frac{9}{2}$

D. $(-)\frac{9}{2}$

Answer:

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52. If α, β are the zeroes of polynomial $f(x) = x^2 - p(x+1) - c$,then $(\alpha+1)(\beta+1)$=

A. c

B. 1+c

C. 1-c

D. c-1

Answer:

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53. If α, β be the zeroes of polynomial $x^2 - 8x + k$such that $\alpha^2 + \beta^2 = 40$ then the value of k will be

a)6 b)9 c)12 d)-12

A. 6

B. 9

C. 12

D. -12

Answer:

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54. If the product of two zeroes of the polynomial $P(x) = 2x^3 + 6x^2 - 4x + 9$ is 3,then its third zero is

a) $\frac{3}{2}$ b) $-\frac{3}{2}$ c) $\frac{9}{2}$ d) $-\frac{9}{2}$

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

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

C. $\frac{9}{2}$

D. $-\frac{9}{2}$

Answer:

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55. Two zeros of polynomial $ax^3 + bx^2 + cx + d$are zero then its third zero is

a/b

b/a

-b/a

d/c

A. a/b

B. b/a

C. -b/a

D. d/c

Answer:

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56. If zeros of the polynomial $x^3 - 3px^2 + qx - r$ are in A.P.then

A. $2p^3 = pq + r$

B. $2p^3 = pq - r$

C. $p^3 = pq - r$

D. None of these

Answer:

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57. If the zeroes of the polynomial $x^3 - 3x^2 + x + 1$ are a-d,a and a+d then a+d is

a)a natural number b)a rational number c)an irrational number d)an integer

A. a natural number

B. a rational number

C. an irrational number

D. an integer

Answer:

58. If α, β, are the zeroes of the polynomial $ax^2 + bx + c$,then $\alpha^2 + \beta^2$=

A. $\frac{b^2 - 2ac}{a^2}$

B. $\frac{a^2 - 2bc}{b^2}$

C. $\frac{b^2 + 2ac}{a^2}$

D. $\frac{a^2 + 2bc}{b^2}$

Answer:

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59. If α, β, be the zeroes of the polynomial $2x^2 + 5x + k$such that $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$ then k=

A. 2

B. -2

C. 3

D. -3

Answer:

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60. If two zeroes of $x^3 + x^2 - 5x - 5$ are $\sqrt{5}$ and $-\sqrt{5}$ then its third zero is

a)1 b)2 c)-1 d)-2

A. 1

B. 2

C. -1

D. -2

Answer:

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61. If α, β, γ be the zeroes of the polynomial $x^3 - 6x^2 - x + 30$, then $\alpha\beta + \beta\gamma + \gamma\alpha$=?

A. 1

B. -1

C. -5

D. 30

Answer:

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62. If α, β, γ,are the zeroes of the polynomial $2x^3 + x^2 - 13x + 6$ then $\alpha\beta\gamma$=?

a)3 b)-3 c)$\frac{-1}{2}$ d)$\frac{-13}{2}$

A. 3

B. -3

C. $\frac{-1}{2}$

D. $\frac{-13}{2}$

Answer:

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63. If x+2 is a factor of $x^2 + ax + 2b$ and a+b=4 then

a=-1,b=5

a=5,b=-1

a=1,b=3

a=3,b=1

A. a=-1,b=5

B. b=5,b=-1

C. a=1,b=3

D. a=3,b=1

Answer:

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64. If α, β, γ,are the zeroes of the polynomial $x^3 - px^2 + qx - r$,then $\frac{1}{\alpha\beta} + \frac{1}{\beta\gamma} + \frac{1}{\gamma\alpha}$=?

p/r

-p/r

r/p

-r/p

A. p/r

B. -p/r

C. r/p

D. -r/p

Answer:

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65. A Quadratic polynomial has three zeroes.True or False

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66. Polynomial $ax^2 + c$ has two zeroes which are equal in magnitude but opposite in sign. True or False

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67. Each polynomial has at least one zero. True or False

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68. State true or false:

We cannot find zeroes of polynomial $x^4 + 16$

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69. Graph of polynomial $x^2 - 5x + 4$will intersect x axis exactly at two distinct points. True or False

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Examples

1. Find the zeroes of the quadratic polynomial $x^2 + 7x + 12$ and verify the relation between the zeroes and its coefficients.

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2. Find the zeroes of the quadratic polynomial $p(x) = 2x^2 + 5x - 12$ and verify the relationship between the zeroes and its coefficients.

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3. Find the zeroes of the quadratic polynomial $p(x) = 4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ and verify the relationship between the zeroes and its coefficients.

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4. Find the zeroes of the quadratic polynomial $p(x) = abx^2 + (b^2 - ac)x - bc$ and verify

the relationship between the zeroes and its coefficients.

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5. If α and $\beta$are the zeroes of the polynomial $p(x) = ax^2 + bx + c$then find the following:

(i)$\alpha^2 + \beta^2$

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6. If α and $\beta$are the zeroes of the polynomial $p(x) = ax^2 + bx + c$then find the following:

(ii)$\alpha^3 + \beta^3$

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7. If α and $\beta$are the zeroes of the polynomial $p(x) = ax^2 + bx + c$then find the following:

(iii)$\alpha^4 + \beta^4$

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8. If α and $\beta$are the zeroes of the polynomial $p(x) = ax^2 + bx + c$ then find the following:

(iv) $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

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9. If α and β are the zeroes of the polynomial $p(x) = ax^2 + bx + c$ then find the following:

(v) $\frac{1}{\alpha^3} + \frac{1}{\beta^3}$

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10. If α and $\beta$are the zeroes of the polynomial $p(x) = ax^2 + bx + c$then find the following:

(vi) $\frac{\alpha^2}{\beta^2} + \frac{\beta^2}{\alpha^2}$

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11. If α and $\beta$are the zeroes of the polynomial $p(x) = ax^2 + bx + c$then find the following:

(vii) $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

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12. If α and β are the zeroes of the quadratic polynomial $p(x) = kx^2 + 4x + 4$such that $\alpha^2 + \beta^2 = 24$then find the value of k.

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13. If the sum of squares of zeroes of the quadratic polynomial $p(x) = x^2 - 8x + k$ are 40 then find the value of k.

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14. Find the condition that the zeroes of the polynomial $f(x) = x^3 - px^2 + qx - r$may be in arithmetic progression.

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15. Find the zeroes of the polynomial $p(x) = x^3 - 5x^2 - 2x + 24$ if it is given that the product of the two zeroes is 12.

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16. Find the values of a and b such that the polynomial $x^4 + x^3 + 8x^2 + ax + b$ is divisible by $x^2 + 1$.

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