doubtnut
India's Number 1 Education App

MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

POLYNOMIAL

Others

1. Draw the graph of the polynomial $f(x) = 2x^2 - 4x + 5.$

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2. If α and β are the zeros of the quadratic polynomial $f(x) = x^2 + x - 2$, find the value of $\frac{1}{\alpha} - \frac{1}{\beta}$

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3. Find a quadratic polynomial whose zeros are reciprocals of the zero of the polynomial $f(x) = ax^2 + bx + c, a \neq 0, c \neq 0.$

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4. If α and β are the zeros of the quadratic polynomial $f(x) = x^2 - x - 2$, find a polynomial whose zeros are $2\alpha + 1$ and $2\beta + 1$.

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5. Draw a graph of the equations: $3x - 2y = 4$ and $x + y - 3 = 0$

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6. If α and β are the zeros of the polynomial $f(x) = 2x^2 + 5x + k$ satisfying the relation $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$, then find the value of k for this to be possible.

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7. If α and β are the zeros of the quadratic polynomial $f(x) = kx^2 + 4x + 4$ such that $\alpha^2 + \beta^2 = 24$, find the value of k.

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8. If α and β ar the zeros of the polynomial $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, find the value of k.

A. -5

B. 6

C. 5

D. -6

Answer: B

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9. If $\alpha and \beta$ are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c,$ then evaluate: $\alpha^4 \beta^4$

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10. If $\alpha and \beta$ are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c,$ then

evaluate: $\alpha^2+\beta^2$ (ii) $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$ (iii) $\alpha^3+\beta^3$

$\frac{1}{\alpha^3}+\frac{1}{\beta^3}$ (v) $\frac{\alpha^2}{\beta}+\frac{\beta^2}{\alpha}$

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11. If $\alpha and \beta$ are the zeros of the quadratic polynomial $f(x)=x^2-px+q,$ then find the values of $(i)\alpha^2+\beta^2$ (ii) $\frac{1}{\alpha}+\frac{1}{\beta}$

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12. If $f(x)$ is a polynomial such that $f(a)f(b) < 0$, then what is the number of zeros lying between a and b ?`

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13. For what value of k, is 3 a zero fo the polynomial $2x^2 + x + k$?

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14. If zeros of the polynomial $f(x) = x^3 - 3px^2 + qx - r$ are in A.P., then

(a) $2p^3 = pq - r$ (b) $2p^3 = pq + r$ (c) $p^3 = pq - r$ (d) None of these

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15. If $ax^2 + bx + c = 0, a, b, c \in R$ has no real zeros, and if $c < 0$, then which of the following is true?

A. a<0

B. a>0

C. a+b+c <0

D. a = 0

Answer: null

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16. What must be added to $f(x) = 4x^4 + 2x^3 - 2x^2 + x - 1$ so that the resulting polynomial is divisible by $g(x) = x^2 + 2x - 3.$

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17. Find the values of a and b so that $x^4 + x^3 + 8x^2 + ax + b$ is divisible by $x^2 - 1$.

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18. Find all zeros of the polynomial $2x^4 + 7x^3 - 19x^2 - 14x + 30$, if two of its zeros are $\sqrt{2}$ and $-\sqrt{2}$.

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19. If the polynomial $6x^4 + 8x^3 + 17x^2 + 21x + 7$ is divided by another polynomial $3x^2 + 4x + 1$, the remainder comes out to be $ax + b$, find a and b.

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20. If α, β, γ are the zeros of the polynomial $f(x) = x^3 - px^2 + qx - r$, then

$\frac{1}{\alpha\beta}+\frac{1}{\beta\gamma}+\frac{1}{\gamma\alpha}=$ (a) $\frac{r}{p}$ (b) $\frac{p}{r}$ (c) $-\frac{p}{r}$ (d) $-\frac{r}{p}$

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21. If α, β are the zeros of the polynomial $f(x)=ax^2+bx+c,$ then $\frac{1}{\alpha^2}+\frac{1}{\beta^2}=$ $\frac{b^2-2ac}{a^2}$ (b) $\frac{b^2-2ac}{c^2}$ (c) $\frac{b^2+2ac}{a^2}$ (d) $\frac{b^2+2ac}{c^2}$

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22. If α, β are the zeros of the polynomial $f(x) = ax^2 + bx + c$, then m m m $\frac{1}{\alpha^2} + \frac{1}{\beta^2} =$ (a) $\frac{b^2 - 2ac}{a^2}$ (b) $\frac{b^2 - 2ac}{c^2}$ (c) $\frac{b^2 + 2ac}{a^2}$ (d) $\frac{b^2 + 2ac}{c^2}$

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23. Divide the polynomial $f(x) = 3x^2 - x^3 - 3x + 5$ by the polynomial $g(x) = x - 1 - x^2$ and verify the division algorithm.

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24. Draw the graph of the polynomial $f(x) = 2x - 5$. Also, find the coordinates of the point where it crosses x-axis

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25. Draw the graph of the polynomial $f(x) = x^2 - 2x - 8$

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26. Draw the graph of the quadratic polynomial $f(x) = 3 - 2x - x^2$

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27. If α and β are the zeros of the polynomial $f(x) = x^2 + px + q$, form a polynomial whose zeros are $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$.

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28. Draw the graph of the polynomial $f(x) = -4x^2 + 4x - 1$. Also find the vertex of this parabola.

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29. If the sum of the zeros of the quadratic polynomial $f(t) = kt^2 + 2t + 3k$ is equal to their product, find the value of k.

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30. Draw the graph of the polynomial $f(x) = -3x^2 + 2x - 1$.

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31. Find the zeros of the quadratic polynomial $x^2 + 7x + 12$, and verify the relation between the zeros and its coefficients.

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32. Find the zeros of polynomial $f(x) = 4\sqrt{3}x^2 + 5x - 2\sqrt{3};$ and verify relation between zeros and its coefficient.

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33. If $\alpha and \beta$ are the zeros of the quadratic polynomial $f(x) = x^2 - px + q,$ prove that $\frac{\alpha^2}{\beta^2} + \frac{\beta^2}{\alpha^2} = \frac{p^4}{q^2} - \frac{4p^2}{q} + 2$

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34. Obtain all the zeros of the polynomial $f(x) = 3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeros are $\sqrt{\frac{5}{3}}$ and $\sqrt{-\frac{5}{3}}$

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35. What must be subtracted from $8x^4 + 14x^3 - 2x^2 + 7x - 8$ so that the resulting polynomial is exactly divisible by $4x^2 + 3x - 2$.

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36. By applying division algorithm prove that the polynomial $g(x) = x^2 + 3x + 1$ is a factor of the polynomial $f(x) = 3x^4 + 5x^3 - 7x^2 + 2x + 2.$

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37. 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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38. Find the zeros of the polynomial $f(x) = x^3 - 5x^2 - 2x + 24$, if it is given that the product of its two zeros is 12.

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39. Draw the graph of the polynomial $f(x) = x^2 - 6x + 9$.

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40. If α and β are the zeros of the quadratic polynomial $f(x) = x^2 - 2x + 3$, find a polynomial whose roots are $\alpha + 2, \beta + 2$.

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41. Draw the graph of the polynomial $f(x) = x^3 - 4x$.

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42. Draw the graph of the cubic polynomial $f(x) = x^3 - 2x^2$.

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43. Draw the graph of the polynomial $f(x) = x^3$.

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44. If each one of the following graphs is the graph of a polynomial, then identify which one corresponds to a linear polynomial and which one corresponds to a quadratic polynomial?

(FIGURE)

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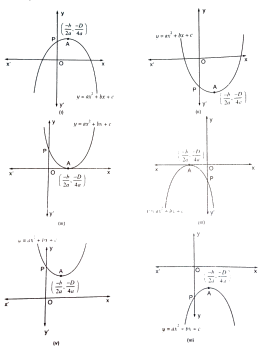
45. The graphs of $y = ax^2 + bx + c$ are given in Fig. Identify the signs of a, b and c in each

of the following: (FIGURE)



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46. Find the zeros of the quadratic polynomial $f(x) = 6x^2 - 3$, and verify the relation-ship between the zeros and its coefficients:

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47. Find the zeros of the polynomial $f(u) = 4u^2 + 8u$, and verify the relationship between the zeros and its coefficients.

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48. Find a quadratic polynomial each with the given numbers as the sum and product of its zeros respectively (i) $\frac{1}{4}, -1$ (ii) $\sqrt{2}, \frac{1}{3}$ (iii) $0, \sqrt{5}$

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49. If α and β are the zeros of the quadratic polynomial $f(x) = 2x^2 - 5x + 7$, find a polynomial whose zeros are $2\alpha + 3\beta$ and $3\alpha + 2\beta$.

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50. If α and β are the zeros of the quadratic polynomial $f(x) = 3x^2 - 4x + 1$, find a quadratic polynomial whose zeros are $\frac{\alpha^2}{\beta}$ and $\frac{\beta^2}{\alpha}$.

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51. Find the zeros of polynomial $f(x) = x^2 - 2x - 8$ and verify the relationship between the zeros and their coefficients:

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52. Find the zeros of polynomial $g(s) = 4s^2 - 4s + 1$ and verify the

relationship between the zeros and their coefficients:

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53. Find the zeros of polynomial $h(t) = t^2 - 15$ and verify the relationship between the zeros and their coefficients:

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54. Find the zeros of polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeros and their coefficients:

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55. Find the zeros of polynomial $p(x) = x^2 + 2\sqrt{2}x - 6$ and verify the relationship between the zeros and their coefficients:

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56. Find the zeros of polynomial $q(x) = \sqrt{3}x^2 + 10x + 7\sqrt{3}$ and verify the relationship between the zeros and their coefficients:

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57. Find the zeros of polynomial $f(x) = x^2 - \left(\sqrt{3} + 1\right)x + \sqrt{3}$ and verify the relationship between the zeros and their coefficients:

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58. Find the zeros of polynomial $g(x) = a(x^2 + 1) - x(a^2 + 1)$ and verify the relationship between the zeros and their coefficients:

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59. If α and β are the zeros of the quadratic polynomial $p(x) = 4x^2 - 5x - 1$, find the

value of $\alpha^2\beta + \alpha\beta^2$.

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60. If α and β are the zeros of the quadratic polynomial $f(t) = t^2 - 4t + 3$, find the value of $\alpha^4\beta^3 + \alpha^3\beta^4$.

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61. If α and β are the zeros of the quadratic polynomial $p(y) = 5y^2 - 7y + 1$, find the

value of $\frac{1}{\alpha}+\frac{1}{\beta}$.

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62. If α and β are the zeros of the quadratic polynomial $f(x)=x^2-x-4$, find the value of $\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta$.

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63. If α and β are the zeros of the quadratic polynomial $f(x)=6x^2+x-2$, find the

value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.

A. $\frac{25}{12}$

B. $\frac{-25}{11}$

C. $\frac{-25}{12}$

D. none of these

Answer: C

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64. If α and β are the zeros of the quadratic polynomial $p(s) = 3s^2 - 6s + 4$, find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} + 2\left(\frac{1}{\alpha} + \frac{1}{\beta}\right) + 3\alpha\beta$.

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65. If one zero of the quadratic polynomial $f(x) = 4x^2 - 8kx - 9$ is negative of the other, find the value of k.

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66. If the squared difference of the zeros of the quadratic polynomial $f(x) = x^2 + px + 45$ is equal to 144, find the value of p.

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67. If α and β are the zeros of the quadratic polynomial $f(x) = x^2 - p(x + 1) - c$, show that $(\alpha + 1)(\beta + 1) = 1 - c$.

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68. If α and β are the zeros of a quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$, find a quadratic polynomial having α and β as its zeros.

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69. If α and β are the zeros of the quadratic polynomial $f(x) = x^2 - 1$, find a quadratic polynomial whose zeros are $\frac{2\alpha}{\beta}$ and $\frac{2\beta}{\alpha}$.

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70. If α and β are the zeros of the quadratic polynomial $f(x) = x^2 - 3x - 2$, find a quadratic polynomial whose zeros are $\frac{1}{2\alpha + \beta}$ and $\frac{1}{2\beta + \alpha}$.

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71. If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate: (i) $\alpha - \beta$ (ii) $\frac{1}{\alpha} - \frac{1}{\beta}$ (iii) $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$

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72. If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate: (i) $\alpha^2\beta + \alpha\beta^2$ (ii) $\alpha^4 + \beta^4$ (iii) $\frac{1}{a\alpha + b} + \frac{1}{a\beta + b}$

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73. If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then

evaluate: (i) $\frac{\beta}{a\alpha+b}+\frac{\alpha}{a\beta+b}$ (ii) $a\left(\frac{\alpha^2}{\beta}+\frac{\beta^2}{\alpha}\right)+b\left(\frac{\alpha}{\beta}+\frac{\beta}{\alpha}\right)$

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74. Verify that $3, -1$ and $-\frac{1}{3}$ are the zeros of the cubic polynomial $p(x)=3x^3-5x^2-11x-3$ and then verify the relationship between the zeros and its coefficients.

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75. Find a cubic polynomial with the sum, sum of the products of its zeros taken two at a time, and product of its zeros as $2, \ -7, \ -14$ respectively.

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76. Find the condition which must be satisfied by the coefficients of the polynomial $f(x) = x^3 - px^2 + qx - r$ when the sum of its two zeros is zero.

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77. If the two zeros of polynomial $f(x) = x^3 - 4x^2 - 3x + 12$ are $\sqrt{3}$ and $-\sqrt{3}$; then find its third zero.

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78. Find the zeros of the polynomial $f(x) = x^3 - 5x^2 - 16x + 80$, if its two zeros are equal in magnitude but opposite in sign.

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79. Find the zeros of the polynomial $f(x) = x^3 - 12x^2 + 39x - 28$, if it is given that the zeros are in A.P.

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80. If the zeros of the polynomial $f(x) = x^3 - 3x^2 + x + 1$ are $a - b,\ \ a,\ \ a + b,$ find a and b .

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81. Verify that the numbers given along side of the cubic polynomial $f(x) = 2x^3 + x^2 - 5x + 2; \quad \frac{1}{2}, \quad 1, \quad -2$ are its zeros. Also, verify the relationship between the zeros and coefficients.

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82. Verify that the numbers given along side of the cubic polynomial $g(x) = x^3 - 4x^2 + 5x - 2; \quad 2, \quad 1, \quad 1$ are its

zeros. Also, verify the relationship between the zeros and coefficients.

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83. Find a cubic polynomial with the sum, sum of the product of its zeros taken two at a time, and product of its zeros as $3, \ -1$ and -3 respectively.

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84. If the zeros of the polynomial $f(x) = 2x^3 - 15x^2 + 37x - 30$ are in A.P., find them.

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85. Find the condition that the zeros of the polynomial $f(x) = x^3 + 3px^2 + 3qx + r$ may be in A.P.

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86. If the zeros of the polynomial $f(x) = ax^3 + 3bx^2 + 3cx + d$ are in A.P., prove that $2b^3 - 3abc + a^2d = 0$.

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87. If the zeros of the polynomial $f(x) = x^3 - 12x^2 + 39x + k$ are in A.P., find the value of k.

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88. Divide the polynomial $f(x) = 14x^3 - 5x^2 + 9x - 1$ by the polynomial $g(x) = 2x - 1$. Also, find the quotient and remainder.

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89. Divide the polynomial $f(x) = 6x^3 + 11x^2 - 39x - 65$ by the polynomial $g(x) = x^2 - 1 + x$. Also, find the quotient and remainder.

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90. Divide the polynomial $u(x) = 9x^4 - 4x^2 + 4$ by the poly-nomial $v(x) = 3x^2 + x - 1$. Also, find the quotient and remainder.

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91. Divide the polynomial $f(x) = 30x^4 + 11x^3 - 82x^2 - 12x + 48$ by $3x^2 + 2x - 4$. Also, find the quotient and remainder.

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92. Apply the division algorithm to find the quotient and remainder on dividing $f(x) = x^3 - 6x^2 + 11x - 6$ by $g(x) = x + 2$

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93. Apply the division algorithm to find the quotient and remainder on dividing $f(x) = x^3 - 3x^2 + 5x - 3$ by $g(x) = x^2 - 2$

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94. Apply the division algorithm to find the quotient and remainder on dividing $f(x) = x^4 - 3x^2 + 4x + 5$ by $g(x) = x^2 + 1 - x$

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95. Apply the division algorithm to find the quotient and remainder on dividing $f(x) = x^4 - 5x + 6$ by $g(x) = 2 - x^2$

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96. Find all the zeros of the polynomial $f(x) = 2x^4 - 3x^3 - 3x^2 + 6x - 2$, if two of its zeros are $\sqrt{2}$ and $-\sqrt{2}$.

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97. If two zeros of the polynomial $f(x) = x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find other zeros.

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98. On dividing the polynomial $f(x) = x^3 - 3x^2 + x + 2$ by a polynomial $g(x)$, the quotient $q(x)$ and remainder $r(x)$ where $q(x) = x - 2$ and $r(x) = -2x + 4$ respectively. Find the polynomial $g(x)$.

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99. If the polynomial $f(x) = x^4 - 6x^3 + 16x^2 - 25x + 10$ 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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100. Apply division algorithm to find the quotient $q(x)$ and remainder $r(x)$ on dividing $f(x) = x^3 - 6x^2 + 11x - 6$ by $g(x) = x^2 + x + 1$

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101. Apply division algorithm to find the quotient $q(x)$ and remainder $r(x)$ on dividing $f(x) = 10x^4 + 17x^3 - 62x^2 + 30x - 3$ by $g(x) = 2x^2 + 7x + 1$

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102. Apply division algorithm to find the quotient $q(x)$ and remainder $r(x)$ on dividing $f(x) = 4x^3 + 8x + 8x^2 + 7$ by $g(x) = 2x^2 - x + 1$

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103. Apply division algorithm to find the quotient $q(x)$ and remainder $r(x)$ on dividing $f(x) = 15x^3 - 20x^2 + 13x - 12$ by $g(x) = 2 - 2x + x^2$

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104. Check whether $g(t) = t^2 - 3$ is a factor of $f(t) = 2t^4 + 3t^3 - 2t^2 - 9t - 12$ by applying the division algorithm.

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105. Check whether $g(x) = x^3 - 3x + 1$ is a factor of $f(x) = x^5 - 4x^3 + x^2 + 3x + 1$ by applying the division algorithm.

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106. Check whether $g(x) = 2x^2 - x + 3$ is a factor of $f(x) = 6x^5 - x^4 + 4x^3 - 5x^2 - x - 15$ by applying the division algorithm.

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107. Obtain all zeros of the polynomial $f(x) = 2x^4 + x^3 - 14x^2 - 19x - 6$, if two of its zeros are -2 and -1.

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108. Obtain all zeros of $f(x) = x^3 + 13x^2 + 32x + 20$, if one of its zeros is -2.

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109. Obtain all zeros of the polynomial $f(x) = x^4 - 3x^3 - x^2 + 9x - 6$, if two of its zeros are $-\sqrt{3}$ and $\sqrt{3}$.

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110. Obtain all zeros of the polynomial $f(x) = 2x^4 - 2x^3 - 7x^2 + 3x + 6$, if its two zeros are $-\sqrt{\frac{3}{2}}$ and $\sqrt{\frac{3}{2}}$.

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111. What must be added to the polynomial $f(x) = x^4 + 2x^3 - 2x^2 + x - 1$ so that the resulting polynomial is exactly divisible by $x^2 + 2x - 3$?

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112. What must be subtracted from the polynomial $f(x) = x^4 + 2x^3 - 13x^2 - 12x + 21$ so that

the resulting polynomial is exactly divisible by $x^4 - 4x + 3$?

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113. Find all zeros of the polynomial $f(x) = x^4 + x^3 - 34x^2 - 4x + 120$, if two of its zeros are 2 and -2 .

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114. Find all zeros of the polynomial $f(x) = 2x^3 + x^2 - 6x - 3$, if two of its zeros are $-\sqrt{3}$ and $\sqrt{3}$.

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115. Find all zeros of the polynomial $f(x) = x^3 + 3x^2 - 2x - 6$, if two of its zeros are $-\sqrt{2}$ and $\sqrt{2}$.

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116. Define a polynomial with real coefficients.

117. Define degree of a polynomial.

118. Write the standard form of a linear polynomial with real coefficients.

119. Write the standard form of a quadratic polynomial with real coefficients.

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120. Write the standard form of a cubic polynomial with real coefficients.

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121. Define value of a polynomial at a point.

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122. Define zero of a polynomial.

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123. The sum and product of the zeros of a quadratic polynomial are $-\frac{1}{2}$ and -3 respectively. What is the quadratic polynomial.

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124. find a quadratic polynomial each with given numbers as the sum and product of its zeroes 1/4,-1.

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125. If the product of zeros of the quadratic polynomial $f(x) = x^2 - 4x + k$ is 3, find the value of k .

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126. If the sum of the zeros of the quadratic polynomial $f(x) = kx^2 - 3x + 5$ is 1, write the value of k .

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127. In Fig. 2.17, the graph of a polynomial $p(x)$ is given. Find the zeros of the polynomial.

(FIGURE)

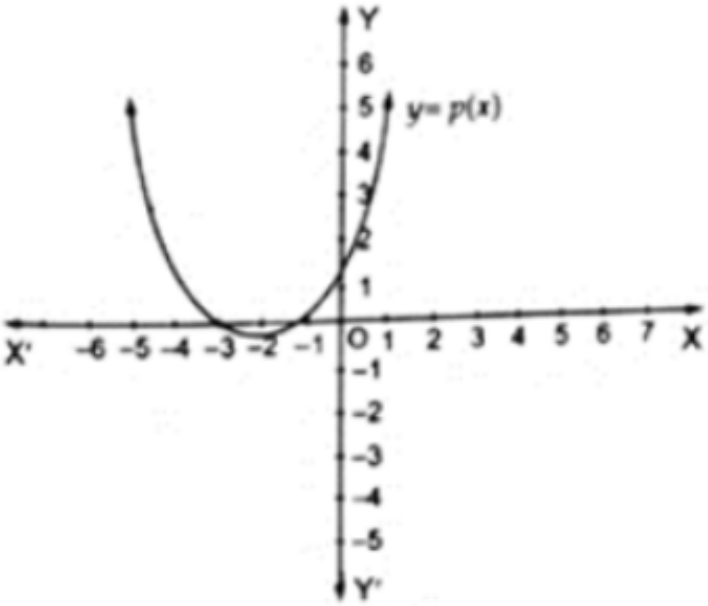

Fig. 2.17

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128. The graph of a polynomial $y = f(x)$, shown in Fig. 2.18. Find the number of real

zeros of $f(x)$. (FIGURE)

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129. The graph of the polynomial $f(x) = ax^2 + bx + c$ is as shown below (Fig. 2.19). Write the signs of $'a'$ and $b^2 - 4ac$.

FIGURE

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130. The graph of the polynomial $f(x) = ax^2 + bx + c$ is as shown in Fig. 2.20. Write the value of $b^2 - 4ac$ and the number of real zeros of $f(x)$. (FIGURE)

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131. In Q. No. 14, write the sign of c .

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132. In Q. No. 15, write the sign of c .

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133. The graph of a polynomial $f(x)$ is as shown in Fig. 2.21. Write the number of real zeros of $f(x)$. (FIGURE)

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134. If $x = 1$ is a zero of the polynomial $f(x) = x^3 - 2x^2 + 4x + k$, write the value of k .

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135. State Division algorithm for polynomials

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136. Give an example of polynomials $f(x)$, $g(x)$, $q(x)$ and $r(x)$ satisfying $f(x) = g(x)\dot{q}(x) + r(x)$, where degree $r(x) = 0$.

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137. Write a quadratic polynomial, sum of whose zeros is $2\sqrt{3}$ and their product is 2.

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138. If fourth degree polynomial is divided by a quadratic polynomial, write the degree of the remainder.

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139. If $f(x) = x^3 + x^2 - ax + b$ is divisible by $x^2 - x$ write the values of a and b.

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140. If $a-b$, a and $a+b$ are zeros of the polynomial $f(x)=2x^3-6x^2+5x-7$, write the value of a.

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141. Write the coefficients of the polynomial $p(z)=z^5-2z^2+4$.

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142. Write the zeros of the polynomial $x^2 - x - 6$.

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143. If $(x + a)$ is a factor of $2x^2 + 2ax + 5x + 10$, find a.

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144. For what value of k, if -4 is a zero of the polynomial $x^2 - x - (2k + 2)$?

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145. If 1 is a zero of the polynomial $p(x) = ax^2 - 3(a - 1)x - 1$, then find the value of a .

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146. If α, β are the zeros of the polynomial such that $\alpha + \beta = -6$ and $\alpha\beta = -4$, then write the polynomial.

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147. If α, β are the zeros of the polynomial $2y^2 + 7y + 5$, write the value of $\alpha + \beta + \alpha\beta$

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148. For what value of k , is 3 a zero of the polynomial $2x^2 + x + k$?

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149. For what value of k , is -3 a zero of the polynomial $x^2 + 11x + k$

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150. If a quadratic polynomial $f(x)$ is factorizable into linear distinct factors, then what is the total number of real and distinct zeros of $f(x)$?

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151. If a quadratic polynomial $f(x)$ is a square of a linear polynomial, then its two zeroes are coincident. (True / False)

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152. If a quadratic polynomial $f(x)$ is not factorizable into linear factors, then it has no real zero. (True/false).

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153. If graph of quadratic polynomial $ax^2 + bx + c$ cuts positive direction of y-axis, then what is the sign of c ?

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154. If the graph of quadratic polynomial $ax^2 + bx + c$ cuts negative direction of y-axis, then what is the sign of c ?

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

(a) 1

(b) -1

(c) 0

(d) None of these

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156. If α, β are the zeros of the polynomial $p(x) = 4x^2 + 3x + 7$, then $\frac{1}{\alpha} + \frac{1}{\beta}$ is equal to

(a) $\frac{7}{3}$

(b) $-\frac{7}{3}$

(c) $\frac{3}{7}$

(d) $-\frac{3}{7}$

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157. If one zero of the polynomial $f(x) = \left(k^2 + 4\right)x^2 + 13x + 4k$ is reciprocal of the other, then $k =$ (a) 2 (b) -2 (c) 1 (d) -1

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158. If the sum of the zeros of the polynomial $f(x) = 2x^3 - 3kx^2 + 4x - 5$ is 6, then the value of k is (a) 2 (b) 4 (c) -2 (d) -4

A. (a) 2

B. null

C. null

D. null

Answer: null

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159. If α and β are the zeros of the polynomial $f(x) = x^2 + px + q$, then a polynomial having $\frac{1}{\alpha}$ and $\frac{1}{\beta}$ as its zeros is

..... (a) $x^2 + qx + p$ (b) $x^2 - px + q$ (c) $qx^2 + px + 1$ (d) $px^2 + qx + 1$

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160. If α, β are the zeros of polynomial $f(x) = x^2 - p(x+1) - c$, then $(\alpha + 1)(\beta + 1) =$ (a) $c - 1$ (b) $1 - c$ (c) c (d) $1 + c$

A. c-1

B. null

C. null

D. null

Answer: null

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161. If α, β are the zeros of the polynomial $f(x) = x^2 - p(x+1) - c$ such that $(\alpha+1)(\beta+1) = 0$, then $c =$ (a) 1 (b) 0 (c) -1 (d) 2

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162. Figure 2.23 show the graph of the polynomial $f(x) = ax^2 + bx + c$ for which (a) $a < 0, b > 0$ and $c > 0$ (b) $a < 0, b < 0$ and $c > 0$ (c) $a < 0, b < 0$ and $c < 0$ (d) $a > 0, b > 0$ and $c < 0$

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163. Figure 2.23 shows the graph of the polynomial $f(x) = ax^2 + bx + c$ for which

(FIGURE) (a) $a\langle 0,\ b\rangle 0\ and\ c>0$ (b)

$a<0, b<0$ and $c>0$ (c)

$a<0,\ b<0\ and\ c<0$ (d)

$a>0,\ b>0\ and\ c<0$

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164. If the product of zeros of the polynomial $f(x)=ax^3-6x^2+11x-6$ is 4, then $a=$

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

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165. If the product of two zeros of the polynomial $f(x) = 2x^3 + 6x^2 - 4x + 9$ is 3, then its third zero is (a) $\frac{3}{2}$ (b) $-\frac{3}{2}$ (c) $\frac{9}{2}$ (d) $-\frac{9}{2}$

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166. If the polynomial $f(x) = ax^3 + bx - c$ is divisible by the polynomial $g(x) = x^2 + bx + c$, then $ab =$ (a) 1 (b) $\frac{1}{c}$ (c) -1 (d) $-\frac{1}{c}$

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167. In Q. No 126, $c =$ (a) b (b) $2b$ (c) $2b^2$ (d) $-2b$

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168. If one root of the polynomial $f(x) = 5x^2 + 13x + k$ is reciprocal of the other, then the value of k is (a) 0 (b) 5 (c) $\frac{1}{6}$ (d) 6

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169. If $\alpha,\ \beta,\ \gamma$ are the zeros of the polynomial $f(x) = ax^3 + bx^2 + cx + d$, then $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma} =$ (a) $\frac{b}{d}$ (b) $\frac{c}{d}$ (c) $-\frac{c}{d}$ (d) $\frac{c}{a}$

A. b/d

B. null

C. null

D. null

Answer: null

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170. If two of the zeros of the cubic polynomial $ax^3 + bx^2 + cx + d$ are each equal to zero, then the third zero is (a) $\frac{d}{a}$ (b) $\frac{c}{a}$ (c) $-\frac{b}{a}$ (d) $\frac{b}{a}$

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171. If two zeros of $x^3 + x^2 - 5x - 5$ are $\sqrt{5}$ and $-\sqrt{5}$, then its third zero is (a) 1 (b) -1 (c) 2 (d) -2

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172. The product of the zeros of $x^3 + 4x^2 + x - 6$ is ..... (a) -4 (b) 4 (c) 6 (d) -6

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173. What should be added to the polynomial $x^2 - 5x + 4$, so that 3 is the zero of the resulting polynomial? (a) 1 (b) 2 (c) 4 (d) 5

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174. What should be subtracted to the polynomial $x^2 - 16x + 30$, so that 15 is the zero of the resulting polynomial? (a) 30 (b) 14 (c) 15 (d) 16

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175. A quadratic polynomial, the sum of whose zeroes is 0 and one zero is 3, is (a) $x^2 - 9$ (b) $x^2 + 9$ (c) $x^2 + 3$ (d) $x^2 - 3$

A. x^2-9 .

B. null

C. null

D. null

Answer: null

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176. If two zeroes of the polynomial $x^3 + x^2 - 9x - 9$ are 3 and -3, then its third zero is (a) -1 (b) 1 (c) -9 (d) 9

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177. If $\sqrt{5}$ and $-\sqrt{5}$ are two zeros of the polynomial $x^3 + 3x^2 - 5x - 15$, then its third zero is (a) 3 (b) -3 (c) 5 (d) -5

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178. If $x + 2$ is a factor of $x^2 + ax + 2b$ and $a + b = 4$, then (a) $a = 1,\ b = 3$ (b)

$a = 3,\ b = 1$ (c) $a = -1,\ b = 5$ (d) $a = 5,\ b = -1$

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179. The polynomial which when divided by $-x^2 + x - 1$ gives a quotient $x - 2$ and remainder 3, is (a) $x^3 - 3x^2 + 3x - 5$ (b) $x^3 - 3x^2 - 3x - 5$ (c) $-x^3 + 3x^2 - 3x + 5$ (d) $x^3 - 3x^2 - 3x + 5$

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