MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

QUADRATIC EQUATIONS

Solved Examples And Exercises

1. The number of roots of the equation $\frac{(x+2)(x-5)}{(x-3)(x+6)} = \frac{x-2}{x+4}$ is

A. 0

B. 1

C. 2

D. 3

Answer: B

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2. If α, β are the roots of the equation $x^2 + px + 1 = 0; \gamma, \delta$ the roots of the

equation $x^2 + qx + 1 = 0$, then

$(\alpha - \gamma)(\alpha + \delta)(\beta - \gamma)(\beta + \delta) =$

A. $q^2 - p^2$

B. $p^2 - q^2$

C. $p^2 = q^2$

D. none of these

Answer: A

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3. The number of real solutions of $\left|2x - x^2 - 3\right| = 1$ is

A. 0

B. 2

C. 3

D. 4

Answer: A

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4. The number of real roots of $\left(x^2+2x\right)^2-(x+1)^2-55=0$

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5. If α, β are the roots of the equation $ax^2+bx+c=0$, then $\frac{1}{a\alpha+b}+\frac{1}{a\beta+b}=$

A. $\frac{c}{ab}$

B. $\frac{a}{bc}$

C. $\frac{b}{ac}$

D. none of these

Answer: B

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6. If α, β are roots of the equation $x^2 + 3x + 7 = 0, then \frac{1}{\alpha} + \frac{1}{\beta}$ is equal to (a) $7/3$ (b) $-7/3$ (c) $3/7$ (d) $-3/7$

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7. The values of x satisfying $(\log)_3\left(x^2+4x+12\right)=2$ are (a) $2,\ -4$ (b) $1,\ -3$ (c) $-1, 3$ (d) $-1,\ -3$

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8. The complete set of values of k, for which the quadratic $x^2-kx+k+2=0$ has equal roots, consists of $2+\sqrt{12}$ (b) $2\pm\sqrt{12}$ (c) $2-\sqrt{12}$ (d) $-2-\sqrt{12}$

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9. For the equation $\left|x^2\right| + |x| - 6 = 0$, the sum of the real roots is (a) 1 (b) 0 (c) 2 (d) none of these

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10. The equation of the smallest degree with real coefficients having $1 + i$ as one of the roots is

A. $x^2 + x + 1 = 0$

B. $x^2 - 2x + 2 = 0$

C. $x^2 + 2x + 2 = 0$

D. $x^2 + 2x - 2 = 0$

Answer: B

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11. The value of p and q for whichp, q are the roots of the equation $x^2 + px + q = 0$ are

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12. The number of solution of $x^2 + |x - 1| = 1$ is (a) 0 (b) 1 (c) 2 (d) 3

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13. If x is real and $k = \frac{x^2 - x + 1}{x^2 + x + 1}$, then $k \in [1/3, 3]$ (b) $k \geq 3$ (c) $k \leq 1/3$ (d) none of these

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14. The one root of the equation $x^2 + px + 12 = 0$ is 4, while the equation $x^2 + px + q = 0$ has equal roots, the value of q is

A. $\frac{49}{4}$

B. $\frac{4}{49}$

C. 4

D. none of these

Answer: A

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15. If the equations $x^2 + 2x + 3\lambda = 0$ and $2x^2 + 3x + 5\lambda = 0$ have a non-zero common roots, then $\lambda =$ (a) 1 (b) -1 (c) 3 (d) none of these

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16. Solve the quadratic equations by using the general expressions for the roots of a

quadratic equation:

$$x^2 - \left(3\sqrt{2} - 2i\right)x - 6\sqrt{2}i = 0$$

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17. Write the number of real roots of the equation

$$(x-1)^2 + (x+2)^2 + (x-3)^2 = 0.$$

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18. Solve: $x^2 - (7-i)x + (18-i) = 0$

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19. If α, β are roots of the equation $x^2 - p(x+1) - c = 0$, then write the value of $(1+\alpha)(1+\beta)$.

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20. Write the roots of the equation $(a-b)x^2 + (b-c)x + (c-a) = 0$.

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21. The least value of k which makes the roots of the equation $x^2 + 5x + k = 0$ imaginary is

A. 4

B. 5

C. 6

D. 7

Answer: D

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22. If α, β are the roots of the equation $x^2 + px + q = 0, then -\frac{1}{\alpha}, -\frac{1}{\beta}$ are the roots of the equation $x^2 - px + q = 0$ (b) $x^2 + px + q = 0$ (c) $qx^2 + px + 1 = 0$ (d) $q^2 - px + 1 = 0$

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23. Solve the equation $9x^2 - 12x + 20 = 0$ by factorization method only.

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24. The set of all values of m for which both the roots of the equation $x^2 - (m+1)x + m + 4 = 0$ are real and negative is (a) $(-\infty, -3] \cup [5, \infty)$ (b) $[-3, 5]$ (c) $(-4, -3]$ (d) $(-3, -1]$

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25. Solve the following quadratic equations by factorization method: $x^2 - 5ix - 6 = 0$

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26. Solve the equation $25x^2 - 30x + 11 = 0$ by using the general expression for roots quadratic equation $ax^2 + bx + c = 0,$ we get: $a = 25, b = -30,$ and $c = 11$.

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27. Solve: $2x^2 - (3 + 7i)x - (3 - 9i) = 0$

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28. The value of k for which the quadratic equation $kx^2 + 1 = kx + 3x - 11x^2$ has real and equal roots are

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29. The value of a such that $x^2 - 11x + a = 0$ and $x^2 - 14x + 2a = 0$ may have a common root is (a)0 (b) 12 (c) 24 (d) 32.

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30. If the roots of $x^2 - bx + c = 0$ are two consecutive integers, then $b^2 - 4c$ is 0 (b) 1 (c) 2 (d) none of these

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31. Solve the equation $4x^2 + 9 = 0$ by factorization method.

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32. Solve the equation $x^2 - 4x + 13 = 0$ by factorization method.

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33. Solve the quadratic equation $2x^2 - 4x + 3 = 0$ by using the general expressions for the roots of a quadratic equation.

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34. Solve the following quadratic equation by factorization method only: $x^2 + 1 = 0$

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35. Solve the following quadratic equation by factorization method only: $x^2 + 2x + 5 = 0$

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36. Solve the following quadratic equation by factorization method only: $x^2 - x + 1 = 0$

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37. Solve the following quadratic equation by factorization method only: $9x^2 + 4 = 0$

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38. Solve the following quadratic equation by factorization method only:

$4x^2 - 12x + 25 = 0$

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39. Solve the following quadratic: $4x^2 + 1 = 0$

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40. Solve the following quadratic:

$x^2 + 2x + 2 = 0$

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41. Solve the following quadratic:

$21x^2 + 9x + 1 = 0$

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42. Solve the following quadratic:

$$x^2 + x + 1 = 0$$

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43. Solve the following quadratic:

$$27x^2 - 10x + 1 = 0$$

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44. Solve the following quadratic:

$$21x^2 - 28x + 10 = 0$$

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45. Solve the equation:

$$\sqrt{3}x^2 - \sqrt{2}x + 3\sqrt{3} = 0$$

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46. Solve the following quadratic:

$$x^2 + x + \frac{1}{\sqrt{2}} = 0$$

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47. Solve $\sqrt{5}x^2 + x + \sqrt{5} = 0$.

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48. Solve the following quadratic:

$$x^2 - 2x + \frac{3}{2} = 0$$

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49. Solve the following quadratic:

$$x^2 - 4x + 7 = 0$$

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50. Solve the following quadratic:

$$5x^2 - 6x - 2 = 0$$

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51. Solve the following quadratic:

$x^2 + x + 1 = 0$

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52. Solve the following quadratic:

$17x^2 - 8x + 1 = 0$

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53. Solve the following quadratic:

$$8x^2 - 9x + 3 = 0$$

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54. Solve the following quadratic:

$$2x^2 + x + 1 = 0$$

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55. Solve the following quadratic:

$$\sqrt{2}x^2 + x + \sqrt{2} = 0$$

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56. Solve the following quadratic:

$$x^2 + \frac{x}{\sqrt{2}} + 1 = 0$$

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57. Solve the following quadratic:

$$x^2 + x - 20 = 0$$

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58. Solve the following quadratic:

$$3x^2 - 4x + \frac{20}{3} = 0$$

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59. Solve the following equation by factorization method: $x^2 - \sqrt{2}i\, x + 12 = 0$

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60. Solve the following equation by factorization method: $3x^2 + 7ix + 6 = 0$

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61. Solve the following equation by factorization method:

$$x^2 - \left(3\sqrt{2} + 2i\right)x + 6\sqrt{2}i = 0$$

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62. Solve the following quadratic equation by factorization method: $x^2 + 10ix - 21 = 0$

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63. Solve the following quadratic equation by factorization method:

$$x^2 - \left(2\sqrt{3} + 3i\right)x + 6\sqrt{3}i = 0$$

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64. Solve the following quadratic equation by factorization method:

$$x^2 + (1 - 2i)x - 2i = 0$$

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65. Solve the following quadratic equation by factorization method: $6x^2 - 17ix - 12 = 0$

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66. Solve the following quadratic equation: $(2+i)x^2 - (5-i)x + 2(1-i) = 0$

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67. Solve the following quadratic equation:

$$ix^2 - 4x - 4i = 0$$

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68. Solve the following quadratic equation:

$$x^2 - (5 - i)x + (18 + i) = 0$$

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69. Solve the following quadratic equation:

$$x^2 - (2+i)x - (1-7i) = 0$$

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70. Solve the following quadratic equation:

$$x^2 + 4ix - 4 = 0$$

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71. Solve the following quadratic equation:

$$2x^2 + \sqrt{15}ix - i = 0$$

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72. Solve the following quadratic equation:

$$ix^2 - x + 12i = 0$$

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73. Solve the following quadratic equation:

$$x^2 - \left(3\sqrt{2} - 2i\right)x - \sqrt{2}i = 0$$

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74. Solve the following quadratic equation:

$$2x^2 - (3 + 7i)x + (9i - 3) = 0$$

$$\alpha = \frac{3}{2} + \left(\frac{1}{2}\right)i \text{ and } \beta = 3i$$

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75. If $a\ and\ b$ are roots of the equation $x^2 - px + q = 0$,then write the value of $\frac{1}{a} + \frac{1}{b}$.

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76. If roots α, β of the equation $x^2 - px + 16 = 0$ satisfy the relation $\alpha^2 + \beta^2 = 9$, then write the value of p.

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77. If $2+\sqrt{3}i$ is a root of the equation $x^2+px+q=0$, then write the values of $p\ and\ q$.

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78. If the difference between the roots of the equation $x^2+ax+8=0$ is 2, write the values of a.

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79. If $a \, and \, b$ are roots of the equation $x^2 - x + 1 = 0$ then write the value of $a^2 + b^2$.

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80. Write the number of quadratic equation with real roots, which do not change by squaring their roots.

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81. If α, β are roots of the equation $x^2 + lx + m = 0$, write an equation whose roots are $-\frac{1}{\alpha}$ and $-\frac{1}{\beta}$.

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82. If a, b are the roots of the equation $x^2 + x + 1 = 0$, $then\, a^2 + b^2 =$

a)1 b)2 c)-1 d)3

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83. If $\alpha \, and \, \beta$ are the roots of $4x^2 + 3x + 7 = 0$ then the value of $\frac{1}{\alpha} + \frac{1}{\beta}$ is

a) $\frac{4}{7}$ b) $-\frac{3}{7}$ c) $\frac{3}{7}$ d) $-\frac{3}{4}$

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84. If the difference of the roots of $x^2 - px + q = 0$ is unity, then

a) $p^2 + 4q = 1$ b) $p^2 - 4q = 1$ c)

$p^2 + 4q^2 = (1 + 2q)^2$ d)

$4p^2 + q^2 = (1 + 2p)^2$

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85. If α, β are the roots of the equation

$x^2 - p(x + 1) - c = 0$ then

$(\alpha + 1)(\beta + 1) =$

a) c b) $c - 1$ c) $1 - c$ d) none of these

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