MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

POLYNOMIAL

Others

1. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 + x - 2$, find the value

of $\frac{1}{\alpha} - \frac{1}{\beta}$.

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2. 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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3. 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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4. 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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5. 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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6. If α and β are the zeros of the polynomial $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, find the value of k.

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

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8. If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c,$ then evaluate: (i) $\alpha^2 + \beta^2$alpha/beta+beta/alpha $\alpha^3 + \beta^3$ $\frac{1}{\alpha^3} + \frac{1}{\beta^3}$ (alpha^2)/beta+(beta^2)/alpha`

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9. If α and β 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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10. 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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11. For what value of k, is 3 a zero fo the polynomial $2x^2 + x + k$?

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12. 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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13. 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? $a < 0\, a + b + c > 0\, a > 0$

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14. 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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15. 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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16. 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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17. 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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18. 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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19. 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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20. If α, β are the zeros of the polynomial $f(x) = ax^2 + bx + c$, then $\frac{1}{\alpha^2} + \frac{1}{\beta^2} =$ (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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21. Divide the polynomial $f(x) = 3x^2 - x^3 - 3x + 5$ by the polynomial `g(x)=x-1and verify the division algorithm.

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22. 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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23. Draw the graph of the polynomial `f(x)=x^2-2

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

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25. 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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26. Draw the graph of the polynomial $f(x) = -42 + 4x - 1$. Also find the vertex of this parabola.

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27. 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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28. 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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29. 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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30. If α and β 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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31. 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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32. 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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33. 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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34. If $\alpha and \beta$ 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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35. 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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36. If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate: (i) $\dfrac{\beta}{a\alpha + b} + \dfrac{\alpha}{a\beta + b}$ (ii) $a\left(\dfrac{\alpha^2}{\beta} + \dfrac{\beta^2}{\alpha}\right) + b\left(\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}\right)$

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