MATHS

BOOKS - CBSE COMPLEMENTARY MATERIAL MATHS (HINGLISH)

POLYNOMIALS

Very Short Answer Type Question

1. 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

Answer: B

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2. 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

Answer: C

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

A. 10

B. -10

C. 5

D. -5

Answer: B

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4. If the zeroes of the quadratic polynomial $x^2 + (a+1)x + b$ are 2 and -3, then

A. $a = -7, b = -1$

B. $a = 5, b = -1$

C. $a = 2, b = -6$

D. $a = 0, b = -6$

Answer: D

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5. 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

A. 1

B. 2

C. 4

D. 5

Answer: B

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6. If α and β are the zeroes of the polynomial $x^2 + x + 1$, then $\frac{1}{\alpha} + \frac{1}{\beta}$=

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

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8. 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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9. The product of the zeros of $x^3 + 4x^2 + x - 6$ is

A. -4

B. 4

C. -6

D. 6

Answer: D

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10. If two of the zeros of the cubic polynomial $ax^3 + bx^2 + cx + d$ are 0 then the third zero is

A. $-\frac{b}{a}$

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

C. $\frac{c}{a}$

D. $-\frac{d}{a}$

Answer: A

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11. What will be the number of zeros of a linear polynomial $p(x)$ if its graph

(i) passes through the origin.

(ii) doesn't intersect or touch x-axis at any point ?

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12. Find the quadratic polynomial whose zeros are

$\left(5+2\sqrt{3}\right)$ and $\left(5-2\sqrt{3}\right)$

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13. If one zero of $p(x) = 4x^2 - (8k^2 - 40k)x - 9$ is negative of the other, find values of k.

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14. 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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15. How many (i) maximum (ii) minimum number of zeroes can a quadratic polynomial have ?

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16. What will be the number of real zeros of the polynomial $x^2 + 1$?

A. -1

B. 0

C. 1

D. 2

Answer: B

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17. If α and β are zeros of polynomial $6x^2 - 7x - 3$, then form a quadratic polynomial where zeros are 2α and 2β

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18. If α and $\frac{1}{\alpha}$ are zeros of $4x^2 - 17x + k - 4$, then find the value of k.

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19. What will be the number of zeros of the polynomials whose graphs are parallel to $(i)y$-axis $(ii)x$-axis ?

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20. What will be number of zeros of the polynomials whose graphs are either touching or intersecting the axis only at the points :

$(i)(3, 0), (0, 2)$ & $(3, 0)$ $(ii)(0, 4), (0, 0)$ and $(0, -4)$

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Short Answer Type I Question

1. 11. If -3 is one of the zeroes of the polynomial $(k-1)x^2 + kx + 1$, find the value of k,

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2. If the product of zeros of $ax^2 - 6x - 6$ is 4, find the value of a. Hence find the sum of its zeros.

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3. 028 The zeroes of $x^2 - kx + 6$ are in the ratio 3:2, find k.

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4. If one zero of the quadratic polynomial $\left(k^2 + k\right)x^2 + 68x + 6k$ is reciprocal of the other , find k.

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5. If $\alpha and \beta$ ar 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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6. If the sum of squares of zeros of the polynomial $x^2 - 8x + k$ is 40, find the value of k.

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7. If α and β are zeros of the polynomial $t^2 - t - 4$, form a quadratic polynomial whose zeros are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.

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8. What should be added to the polynomial $x^3 - 3x^2 + 6x - 15$, so that it is completely divisible by $x - 3$?

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9. If m and n are the zeros of the polynomial $3x^2 + 11x - 4$, find the value of $\frac{m}{n} + \frac{n}{m}$.

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10. Find a quadratic polynomial whose zeros are $\frac{3+\sqrt{5}}{5}$ and $\frac{3-\sqrt{5}}{5}$.

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Short Answer Type Ii Question

1. If $(k+y)$ is a factor of each of the polynomials $y^2+2y-15$ and y^3+a, find the values of k and a.

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2. 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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3. If the polynomial $\left(x^4+2x^3+8x^2+12x+18\right)$ is divided by another polymial $\left(x^2+5\right)$, the remainder comes out to be $(px+q)$. Find the values of p and q.

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4. If -5 is a root of the quadratic equation $2x^2+px-15=0$ and the quadratic equation $p\left(x^2+x\right)+k=0$ has equal roots, find the value of k.

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5. Find the value of k such that $3x^2 + 2kx + x - k - 5$ has the sum of zeros as half of their product.

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6. If α and β are zeros of $y^2 + 5y + m$, find the value of m such that $(\alpha + \beta)^2 - \alpha\beta = 24$

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7. If $\alpha and \beta$ 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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8. 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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9. 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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10. 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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Long Answer Type Question

1. 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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2. If $\sqrt{2}$ is a zero of $p(x) = 6x^3 + \sqrt{2}x^2 - 10x - 4\sqrt{2}$, find the remaining zeros

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3. 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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4. On dividing the polynomial $x^3 - 5x^2 + 6x - 4$ by a polynomial $g(x)$, quotient and remainder are $(x - 3)$ and $(-3x + 5)$ respectively. Find $g(x)$

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5. 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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6. If the polynomial $x^4 - 3x^3 - 6x^2 + kx - 16$ is exactly divisible by $x^2 - 3x + 2$, then find the value of k.

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7. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder copies out to be $x\ + \ a$. find k and a.

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8. If α and β are the zeroes of the polynomial $x^2 + 4x + 3 = 0$,find the polynomial whose zeroes are $1 + \frac{\beta}{\alpha}$ and $1 + \frac{\alpha}{\beta}$

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9. Find K, so that $x^2 + 2x + K$ is a factor of $2x^4 + x^3 - 14x^2 + 5x + 6$. Also find all the zeros of the two polynomials.

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10. If $x - \sqrt{5}$ is a factor of the cubic polynomial $x^3 - 3\sqrt{5}x^2 + 13x - 3\sqrt{5}$, then find all the zeroes of the polynomial.

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Practice Test

1. If α and β are zeros of a quadratic polynomial $p(x)$, then factorize $p(x)$.

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

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3. Q. If one zero of the quadratic polynomial $(k-1)x^2 + kx + 1$ is-3, then find the value of K

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

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

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

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

Answer:

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4. A quadratic polynomial, whose zeroes are -3 and 4, is

A. $x^2 - x + 12$

B. $x^2 + x + 12$

C. $\frac{x^2}{2} - \frac{x}{2} - 6$

D. $2x^2 + 2x - 24$

Answer: C

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5. If α, β are the zeros of the polynomial $x^2 - (k+6)x + 2(2k-1)$. Find k if $\alpha + \beta = \frac{1}{2}(\alpha \cdot \beta)$

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6. Find a quadratic polynomial one of whose zeros is $\left(3+\sqrt{2}\right)$ and the sum of its zeros is 6

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7. If zeros of the polynomial $x^2+4x+2a$ are α and $\frac{2}{\alpha}$ then find the value of a.

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8. Find values of a and b if $\left(x^2+1\right)$ is a factor of the polynomial $x^4+x^3+8x^2+ax+b$

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9. If truth and lie are zeros of the polynomial $px^2+qx+r,\ (p\neq 0)$ and those zeros are reciprocal to each other, Find the relation between p and r.

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10. On dividing the polynomial $x^3 + 2x^2 + kx + 7$ by $(x - 3)$, remainder comes out to be 25 . Find quotient and the value of k. Also find the sum and product of zeros of the quotient so obtained.

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