

Question Bank

GRADE : 10

Subject: Math

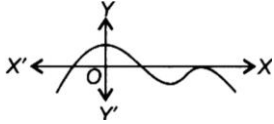
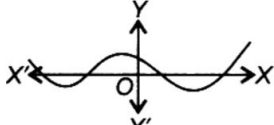
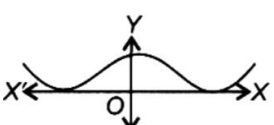
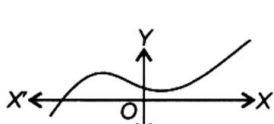
Chapter : 2- Polynomials

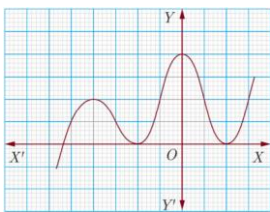
Course Faculty : Mrs. Rosemary . P and Mr.Sanjeev

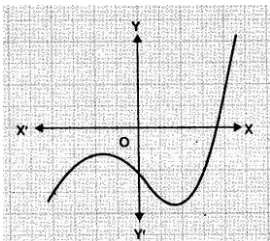
Section A		
1	If α and β are the zeroes of the quadratic polynomial $p(x) = x^2 - ax - b$, then the value of $\alpha^2 + \beta^2$ is: a) $b^2 + 2a$ CBSE 2020 (Set 1) b) $a^2 - 2b$ c) $b^2 - 2a$ d) $a^2 + 2b$	[1]
2	A quadratic polynomial whose sum and product of zeroes are 2 and - 1 respectively is: CBSE 2019 (Delhi) a) $x^2 + 2x + 1$ b) $x^2 + 2x - 1$ c) $x^2 - 2x - 1$ d) $x^2 - 2x + 1$	[1]
3	If one zero of the quadratic polynomial $x^2 - 5x + k$ is - 4 , then the value of k is CBSE 2018 (Outside Delhi) a) 18 b) - 18 c) - 36 d) 36	[1]
4	If α and β are the zeroes of the polynomial $3x^2 + 11x - 4$, then the value of $\frac{1}{\alpha} + \frac{1}{\beta}$ is CBSE 2017 (Set 2) a) $\frac{13}{4}$ b) $\frac{15}{4}$	[1]

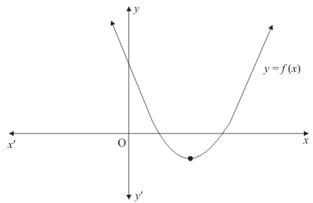
	<p>c) $\frac{11}{4}$</p> <p>d) $\frac{12}{4}$</p>	
5	<p>If α, β are the zeros of $kx^2 - 2x + 3k$ such that $\alpha + \beta = \alpha\beta$ then $k = ?$ CBSE Sample Paper 2021</p> <p>a) $-\frac{1}{3}$</p> <p>b) $\frac{2}{3}$</p> <p>c) $\frac{1}{3}$</p> <p>d) $\frac{7}{2}$</p>	[1]
6	<p>If α and β are the zeroes of the polynomial $x^2 - 6x + 8$, then the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$ is CBSE 2016 (Delhi)</p> <p>a) 8</p> <p>b) 12</p> <p>c) 6</p> <p>d) 9</p>	[1]
7	<p>If α, β are zeroes of the polynomial $x^2 - 1$, then value of $(\alpha + \beta)$ is: CBSE 2020 (Outside Delhi)</p> <p>a) 2</p> <p>b) - 1</p> <p>c) 0</p> <p>d) 1</p>	[1]
8	<p>The zeroes of the quadratic polynomial $2x^2 - 3x - 9$ are: CBSE 2019 (Set 3)</p> <p>a) $3, \frac{3}{2}$</p> <p>b) $3, \frac{-3}{2}$</p> <p>c) $-3, \frac{3}{2}$</p> <p>d) $-3, \frac{-3}{2}$</p>	[1]
9	<p>Given that two of the zeros of the cubic polynomial $ax^3 + bx^2 + cx + d$ are 0, the value of c is CBSE Exemplar</p> <p>a) less than 0</p> <p>b) can't say</p> <p>c) equal to 0</p>	[1]

	d) greater than 0	
10	The sum and product of the zeroes of the polynomial $f(x) = 4x^2 - 27x + 3k^2$ are equal, then the value of k is CBSE 2022 (Term-2) a) ± 2 b) ± 3 c) ± 1 d) 0	[1]
11	If the sum of zeroes of the polynomial $p(x) = 2x^2 - k\sqrt{2}x + 1$ is $\sqrt{2}$, then value of k is: CBSE 2018 (Set 1) a) $\frac{1}{2}$ b) $2\sqrt{2}$ c) $\sqrt{2}$ d) 2	[1]
12	The sum and product of the zeroes of the polynomial $x^2 - 6x + 8$ are respectively CBSE 2016 (Outside Delhi) a) 6 and 8 b) $\frac{-3}{2}$ and -1 c) $\frac{-3}{2}$ and 1 d) $\frac{3}{2}$ and 1	[1]
13	The zeroes of the polynomial $x^2 - 3x - m(m + 3)$ are: CBSE 2020 (Set 2) a) m, m + 3 b) $-m$, m + 3 c) m, $-(m + 3)$ d) $-m$, $-(m + 3)$	[1]
14	If sum of all zeros of the polynomial $5x^2 - (3 + k)x + 7$ is zero, then zeroes of the polynomial $2x^2 - 2(k + 11)x + 30$ are CBSE 2023 (Sample Paper) a) 7, 9 b) 2, 5 c) 3, 5 d) 3, 6	[1]

15	<p>If α, β are the zeros of the polynomial $f(x) = x^2 + x + 1$, then $\frac{1}{\alpha} + \frac{1}{\beta} =$ CBSE Exemplar</p> <p>a) 0 b) -1 c) 1 d) 2</p>	[1]
16	<p>Which of the following graph has more than three distinct real roots? CBSE 2019 (Delhi)</p> <p>a) </p> <p>b) </p> <p>c) </p> <p>d) </p>	[1]
17	<p>If the sum and the product of zeroes of a quadratic polynomial are $2\sqrt{3}$ and 3 respectively, then a quadratic polynomial is: CBSE 2022 (Term-1 MCQ)</p> <p>a) $x^2 - 2\sqrt{3}x - 3$ b) $(x - \sqrt{3})^2$ c) $x^2 + 2\sqrt{3}x + 3$ d) $x^2 + 2\sqrt{3}x - 3$</p>	[1]
18	<p>If α and β are the zeros of $2x^2 + 5x - 9$ then the value of $\alpha\beta$ is CBSE 2018 (Delhi)</p> <p>a) $\frac{5}{2}$ b) $-\frac{9}{2}$ c) $\frac{9}{2}$ d) $-\frac{5}{2}$</p>	[1]
19	<p>The number of polynomials having zeroes - 3 and 5 is: CBSE Exemplar</p> <p>a) at most two</p>	[1]

	<p>b) infinite</p> <p>c) only one</p> <p>d) exactly two</p>	
20	<p>A quadratic polynomial the sum and product of whose zeroes are - 3 and 2 respectively, is:</p> <p>CBSE 2017 (Outside Delhi)</p> <p>a) $x^2 + 3x - 2$</p> <p>b) $x^2 + 3x + 2$</p> <p>c) $x^2 - 3x - 2$</p> <p>d) $x^2 - 3x + 2$</p>	[1]
21	<p>Assertion (A): A constant polynomial always cuts the x - axis at only one point. CBSE 2020 (Term-1)</p> <p>Reason (R): Constant polynomial does not have any zero.</p> <p>a) Both A and R are true and R is the correct explanation of A.</p> <p>b) Both A and R are true but R is not the correct explanation of A.</p> <p>c) A is true but R is false.</p> <p>d) A is false but R is true.</p>	[1]
22	<p>Assertion (A): The graph $y = f(x)$ is shown in figure, for the polynomial $f(x)$. The number of zeros of $f(x)$ is 3. CBSE 2019 (Delhi)</p> <p>Reason (R): The number of zero of the polynomial $f(x)$ is the number of point of which $f(x)$ cuts or touches the axes.</p>  <p>a) Both A and R are true and R is the correct explanation of A.</p> <p>b) Both A and R are true but R is not the correct explanation of A.</p> <p>c) A is true but R is false.</p> <p>d) A is false but R is true.</p>	[1]
23	<p>Assertion: The sum and product of the zeros of a quadratic polynomial are $-\frac{1}{4}$ and $\frac{1}{4}$ respectively. CBSE 2022 (Sample Paper)</p> <p>Then the quadratic polynomial is $4x^2 + x + 1$.</p> <p>Reason: The quadratic polynomial whose sum and product of zeros are given is $x^2 - (\text{sum of zeros}) \cdot x + \text{product of zeros}$.</p>	[1]

	<p>a) Assertion and reason both are correct statements and reason is correct explanation for assertion.</p> <p>b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.</p> <p>c) Assertion is correct statement but reason is wrong statement.</p> <p>d) Assertion is wrong statement but reason is correct statement.</p>	
24	<p>Assertion (A): If the product of the zeroes of the quadratic polynomial $x^2 + 3x + 5k$ is -10 then value of k is -2. CBSE 2018 (Outside Delhi)</p> <p>Reason (R): Sum of zeroes of quadratic polynomial $ax^2 + bx + c$ is $-\frac{b}{a}$.</p> <p>a) Both A and R are true and R is the correct explanation of A.</p> <p>b) Both A and R are true but R is not the correct explanation of A.</p> <p>c) A is true but R is false.</p> <p>d) A is false but R is true.</p>	[1]
25	<p>Assertion (A): $x^2 + 7x + 12$ has no real zeros CBSE Exemplar / Repeated Board</p> <p>Reason (R): A quadratic polynomial can have at the most two zeroes.</p> <p>a) Both A and R are true and R is the correct explanation of A.</p> <p>b) Both A and R are true but R is not the correct explanation of A.</p> <p>c) A is true but R is false.</p> <p>d) A is false but R is true.</p>	[1]
26	<p>If α, β are the zeros of a polynomial such that $\alpha + \beta = -6$ and $\alpha\beta = -4$, then write the polynomial. CBSE 2016 (Delhi)</p>	[2]
27	<p>For a polynomial $p(x)$, the graph of $y = p(x)$ is given below. Find the number of zeroes of $p(x)$.</p>  <p>CBSE 2020 (Outside Delhi)</p>	[2]
28	<p>If α and β are the zeros of the polynomial $f(x) = 5x^2 - 7x + 1$, find the value of $\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$. CBSE 2018 (Set 3)</p>	[2]
29	<p>Find the zeroes of the given quadratic polynomials $t^2 - 15$ and verify the relationship between the zeroes and the coefficients. CBSE 2017 (Set 1)</p>	[2]
30	<p>If one zero of the polynomial $x^2 - 8x + k$ exceeds the other by 2, then find the zeroes and the value of k. CBSE 2019 (Delhi)</p>	[2]
31	<p>Find the zeros of $h(t) = t^2 - 15$ and verify the relationship between the zeros and its coefficients. CBSE Exemplar</p>	[2]

32	Form a quadratic polynomial whose zeroes are $\frac{3-\sqrt{3}}{5}$ and $\frac{3+\sqrt{3}}{5}$. CBSE 2016 (Outside Delhi)	[2]
33	If α and β are the zeros of the quadratic polynomial $f(x) = 6x^2 + x - 2$, find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$. CBSE 2018 (Delhi)	[2]
34	If α and β are the zeroes of the quadratic polynomial $x^2 - 5x + 6$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$. CBSE Sample Paper 2020	[2]
35	Find the zeroes of the polynomial $4x^2 + 17x - 15$ and verify the relationship between the zeroes and the coefficients. CBSE 2017 (Outside Delhi)	[2]
36	The graph of the polynomial $f(x) = ax^2 + bx + c$ is as shown below (Fig.). Write the signs of 'a' and $b^2 - 4ac$ CBSE 2023 (Competency Based)	[2]
		
37	Find the zeroes of the quadratic polynomial $x^2 + 6x + 8$ and verify the relationship between the zeroes and the coefficients. CBSE 2019 (Set 2)	[2]
38	Find the zeros of the polynomial $f(x) = x^2 - 2$ and verify the relationship between its zeros and coefficients. CBSE Exemplar	[2]
39	If one zero of the quadratic polynomial $2x^2 + px + 4$ is 2, find the other zero. Also, find the value of p. CBSE 2020 (Delhi)	[2]
40	Find the zeroes of the polynomial $5t^2 + 12t + 7$ by factorization method and verify the relation between the zero and the coefficient of the polynomial. CBSE 2018 (Outside Delhi)	[2]
41	Find the zeroes of the quadratic polynomial $3x^2 - 2$ and verify the relationship between the zeroes and the coefficients. CBSE 2016 (Delhi)	[3]
42	If α, β are zeroes of the quadratic polynomial $x^2 + 3x + 2$, find a quadratic polynomial whose zeroes are $\alpha + 1, \beta + 1$. CBSE 2019 (Outside Delhi)	[3]
43	If the coefficient of x in a quadratic polynomial is zero, then prove that zeros will be equal in magnitude and opposite in sign. CBSE 2018 (HOTS)	[3]
44	If α, β are the zeroes of the $x^2 + 7x + 7$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$. CBSE Sample Paper 2021	[3]
45	Find the zeroes of quadratic polynomial $x^2 - 2x - 8$ and verify the relationship between the zeroes and their coefficients. CBSE 2017 (Set 3)	[3]
46	Find the zeros of $p(x) = x^2 + 2\sqrt{2}x - 6$ and verify the relationship between the zeros and its coefficients. CBSE 2020 (Delhi)	[3]
47	If one zero of the polynomial $2x^2 + 3x + \lambda$ is $\frac{1}{2}$, find the value of λ and other zero. CBSE 2019 (Set 1)	[3]
48	Find the zeroes of the quadratic polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeroes and the coefficients of the polynomial. CBSE 2018 (Outside Delhi)	[3]
49	If one root of the quadratic polynomial $2x^2 - 3x + p$ is 3, find the other root. Also, find the value of p. [3]	[3]
50	Find a quadratic polynomial whose sum and product of the zeroes are $\frac{-3}{2\sqrt{5}}, -\frac{1}{2}$ respectively. Also find the zeroes of the polynomial by factorisation. CBSE 2022 (Term-2)	[3]

51	Find the zeroes of the polynomial $7y^2 - \frac{11}{3}y - \frac{2}{3}$ by factorisation method and verify the relationship between the zeroes and coefficient of the polynomial. CBSE 2016 (Outside Delhi)	[3]
52	Find a quadratic polynomial whose sum and product of the zeroes are $-2\sqrt{3}, -9$ respectively. Also find the zeroes of the polynomial by factorisation. CBSE Sample Paper 2020	[3]
53	If α and β are the zeros of the quadratic polynomial $f(x) = x^2 - 2x + 3$, find a polynomial whose roots are CBSE 2019 (Delhi) 1. $\alpha + 2, \beta + 2$ 2. $\frac{\alpha-1}{\alpha+1}, \frac{\beta-1}{\beta+1}$	[3]
54	Find the quadratic polynomial, sum and product of whose zeroes are - 1 and - 20 respectively. Also find the zeroes of the polynomial so obtained. CBSE 2018 (Set 2)	[3]
55	Find the zeroes of the given quadratic polynomials and verify the relationship between the zeroes and their coefficients $x^2 - 6$. CBSE Exemplar	[3]
56	Find the zeros of $q(y) = 7y^2 - \frac{11}{3}y - \frac{2}{3}$ and verify the relationship between the zeros and its coefficients. CBSE 2017 (Delhi)	[5]
57	Without actually calculating the zeroes, form a quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $5x^2 + 2x - 3$. CBSE 2018 (HOTS)	[5]
58	Find the zeros of $f(v) = v^2 + 4\sqrt{3}v - 15$ and verify the relationship between the zeros and its coefficients. CBSE 2016 (Set 1)	[5]
59	If β and $\frac{1}{\beta}$ are zeroes of the polynomial $(\alpha^2 + \alpha)x^2 + 61x + 6\alpha$. Find the values of β and α . CBSE 2019 (Outside Delhi)	[5]
60	Obtain the other zeroes of the polynomial $p(x) = x^4 + 2x^3 - 7x^2 - 8x + 12$ if two of its zeroes are (- 2) and (- 3). CBSE 2020 (Delhi)	[5]
61	Find the zeroes of a quadratic polynomial $2x^2 + 3x - 14$ and verify the relationship between the zeroes and its coefficients. CBSE 2017 (Outside Delhi)	[5]
62	If α and β are zeroes of the polynomial $p(x) = 6x^2 - 5x + k$ such that $\alpha - \beta = \frac{1}{6}$, find the value of k. CBSE Sample Paper 2022	[5]
63	If α and β are the zeroes of the polynomial $x^2 + 4x + 3$, find the polynomial whose zeroes are $1 + \frac{\beta}{\alpha}$ and $1 + \frac{\alpha}{\beta}$. CBSE 2018 (Delhi)	[5]
64	If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate: $a\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right) + b\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)$ CBSE Exemplar	[5]
65	Find the zeros of $f(s) = 2s^2 - (1 + 2\sqrt{2})s + \sqrt{2}$ and verify the relationship between the zeros and its coefficients. CBSE Exemplar	[5]
66	Read the following text carefully and answer the questions that follow: CBSE 2023 (Competency Based) An object which is thrown or projected into the air, subject to only the acceleration of gravity is called a projectile, and its path is called its trajectory. This curved path was shown by Galileo to be a parabola. Parabola is represented by a polynomial. If the polynomial to represent the distance covered is, $p(t) = - 5t^2 + 40t + 1.2$	[4]

3. What is the degree of the polynomial $p(t) = -5t^2 + 40t + 1.2$? (1)
4. What is the height of the projectile at the time of 4 seconds after it is launched? (1)
5. What is the name of the polynomial $p(t) = -5t^2 + 40t + 1.2$ that is classified based on its degree? (2)

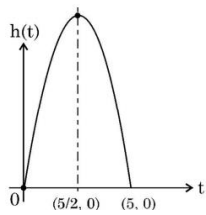
OR

What are the factors of the given quadratic equation $p(x) = x^2 - 5x + 6$? (2)

67 **Read the following text carefully and answer the questions that follow: CBSE 2022**

[4]

A ball is thrown in the air so that t seconds after it is thrown, its height h metre above its starting point is given by the polynomial $h = 25t - 5t^2$.



Observe the graph of the polynomial and answer the following questions:

6. Write zeroes of the given polynomial. (1)
7. Find the maximum height achieved by ball. (1)
8.
 - a. After throwing upward, how much time did the ball take to reach to the height of 30 m? (2)

OR

- b. Find the two different values of t when the height of the ball was 20 m. (2)

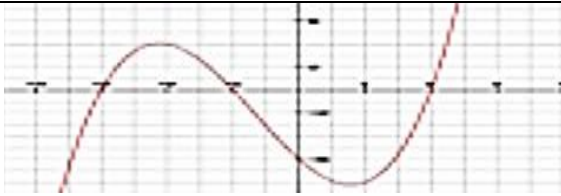
68 **Read the following text carefully and answer the questions that follow: CBSE 2023**

[4]

Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the form of parabola representing quadratic polynomial.



9. Which type the shape of the path traced shown in given figure? (1)
10. Why the graph of parabola opens upwards? (1)
11. In the below graph, how many zeroes are there? (2)



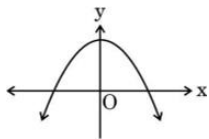
OR

What is the condition for the graph of parabola to open downwards? (2)

69 **Read the following text carefully and answer the questions that follow: CBSE 2024**

[4]

Rainbow is an arch of colours that is visible in the sky after rain or when water droplets are present in the atmosphere. The colours of the rainbow are generally, red, orange, yellow, green, blue, indigo and violet. Each colour of the rainbow makes a parabola. We know that any quadratic polynomial $p(x) = ax^2 + bx + c$ ($a \neq 0$) represents a parabola on the graph paper.



12. The graph of a rainbow $y = f(x)$ is shown in the figure. Write the number of zeroes of the curve. (1)
13. If the graph of a rainbow does not intersect the x - axis but intersects y - axis at one point, then how many zeroes will it have? (1)
14. If a rainbow is represented by the quadratic polynomial $p(x) = x^2 + (a + 1)x + b$, whose zeroes are 2 and - 3, find the value of a and b . (2)

OR

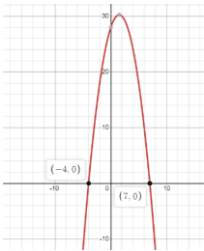
The polynomial $x^2 - 2x - (7p + 3)$ represents a rainbow. If - 4 is a zero of it, find the value of p . (2)

70

Read the following text carefully and answer the questions that follow: CBSE 2023 (Sample Paper)

[4]

Two friends Govind and Pawan decided to go for a trekking. During summer vacation, they went to Panchmarhi. While trekking they observed that the trekking path is in the shape of a parabola. The mathematical representation of the track is shown in the graph.



15. What are the zeroes of the polynomial whose graph is given? (1)
16. What will be the expression of the given polynomial $p(x)$? (1)
17. What is the product of the zeroes of the polynomial which represents the parabola? (2)

OR

In the standard form of quadratic polynomial, $ax^2 + bx + c$, what are a , b , and c ? (2)