

Maxprap. Chapter wise Series Class 10th - Polynomials

Class : 10th

Subject: Mathematics

Max. Marks : 50

Duration : 2 Hrs

Sections: A (MCQs), B (Short Answer-I), C (Short Answer-II), D (Long Answer), E (Case-Based).

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 23 questions divided into five Sections A, B, C, D and E. (iii). Section A comprises of 10 MCQs of 1 mark each. Section B comprises of 5 questions of 2 marks each. Section C comprises of 4 questions of 3 marks each. Section D comprises of 2 question of 5 marks each and Section E comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted.
- (vi). Draw neat figures wherever required. Take $\pi = 22/7$, wherever required if not stated.

Section A

Questions 1 to 10 carry 1 mark each

1. If α and β ($\alpha > \beta$) are the zeroes of the polynomial $-x^2 + 8x + 9$, then $(\alpha - \beta)$ is equal to
a) 8 b) ± 10 c) 10 d) -10
2. If one zero of the polynomial $f(x) = (k^2 + 4)x^2 + 13x + 4k$ is reciprocal of other, then $k =$
a) 1 b) -2 c) 2 d) -1
3. If α and β are zeros of $x^2 + 5x + 8$, then the value of $(\alpha + \beta)$ is
a) 8 b) -8 c) 5 d) -5
4. The zeroes of the quadratic polynomial $2x^2 - 3x - 9$ are:
a) $3, \frac{3}{2}$ b) $3, \frac{-3}{2}$ c) $-3, \frac{3}{2}$ d) $-3, \frac{-3}{2}$
5. If α, β are the zeros of the polynomial $f(x) = x^2 + x + 1$, then $\frac{1}{\alpha} + \frac{1}{\beta} =$
a) 0 b) -1 c) 1 d) 2
6. A quadratic polynomial whose zeros are $\frac{3}{5}$ and $\frac{-1}{2}$, is
a) $10x^2 - x - 3$ b) $10x^2 - x + 3$ c) $10x^2 + x + 3$ d) $10x^2 + x - 3$
7. A quadratic polynomial with sum and product of its zeros as 8 and -9 respectively is
a) $x^2 + 8x - 9$ b) $x^2 - 8x - 9$ c) $x^2 - 8x + 9$ d) $x^2 + 8x + 9$
8. A quadratic polynomial, whose zeros are 5 and -8 is
a) $x^2 + 13x - 40$ b) $x^2 - 3x - 40$ c) $x^2 + 3x - 40$ d) $x^2 + 4x - 3$

Assertion(A)/Reason(R) Based (9-10): In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

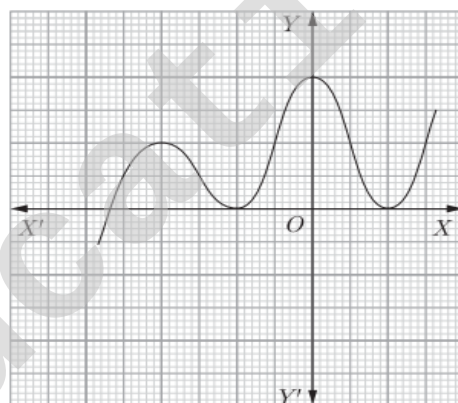
- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

9. Assertion (A): A quadratic polynomial, sum of whose zeroes is 8 and their product is 12 is $x^2 - 20x + 96$

Reason (R): If α and β be the zeroes of the polynomial $f(x)$, then polynomial is given by $f(x) = x^2 - (\alpha + \beta)x + \alpha\beta$

10. Assertion (A): The graph $y = f(x)$ is shown in figure, for the polynomial $f(x)$. The number of zeros of $f(x)$ is 4.

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.



SECTION – B

Questions 11 to 15 carry 2 marks each

11. If α and β are the zeros of the quadratic polynomial $f(x) = 6x^2 + x - 2$, find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.
12. Show that the polynomial $f(x) = x^4 + 4x^2 + 6$ has no real zero.
13. Find the zeroes of the quadratic polynomial $p(y) = 4\sqrt{3}y^2 + 5y - 2\sqrt{3}$ and verify the relationship between the zeroes and their coefficients.
14. If graph of quadratic polynomial $ax^2 + bx + c$ cuts positive direction of y – axis, then what is the sign of c ?
15. Find zeroes of a polynomial $6x^2 - 18x + 12$ and verify the relationship between zeroes and coefficients of variables in the polynomial.

SECTION – C

Questions 16 to 19 carry 3 marks each

16. Find the zeroes of the quadratic polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeroes and the coefficients of the polynomial.

17. If α, β are the zeros of the polynomial $2x^2 - 4x + 5$. find the value of (i) $\alpha^2 + \beta^2$ (ii) $(\alpha - \beta)^2$.

18. 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 .

19. If α, β are the zeroes of the $x^2 + 7x + 7$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$.

SECTION – D

Questions 20 to 21 carry 5 marks each.

20. Find the zeros of $f(x) = x^2 + 4\sqrt{3}x - 15$ and verify the relationship between the zeros and its coefficients.

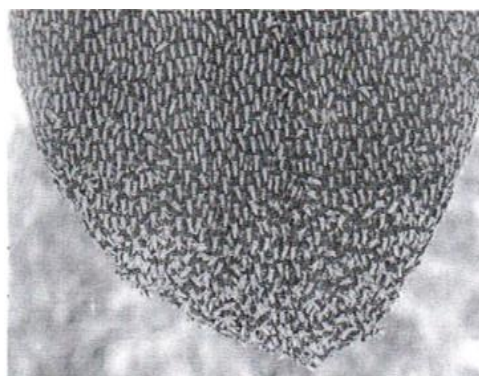
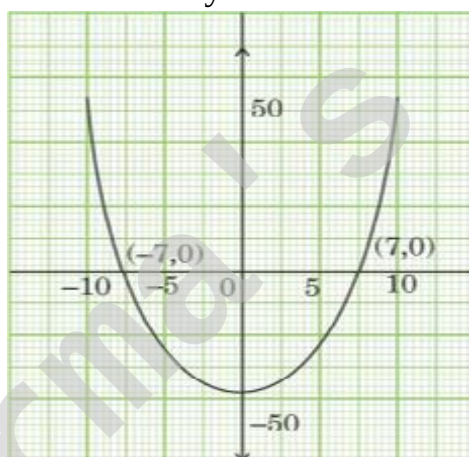
21. Without actually calculating the zeroes, form a quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $5x^2 + 2x - 3$.

SECTION – E (Case Study Based Questions)

Questions 22 & 23 carry 4 marks each

22. Read the following text carefully and answer the questions that follow:

While playing in a garden, Samaira saw a honeycomb and asked her mother what is that. Her mother replied that it's a honeycomb made by honey bees to store honey. Also, she told her that the shape of the honeycomb formed is a mathematical structure. The mathematical representation of the honeycomb is shown in the graph.



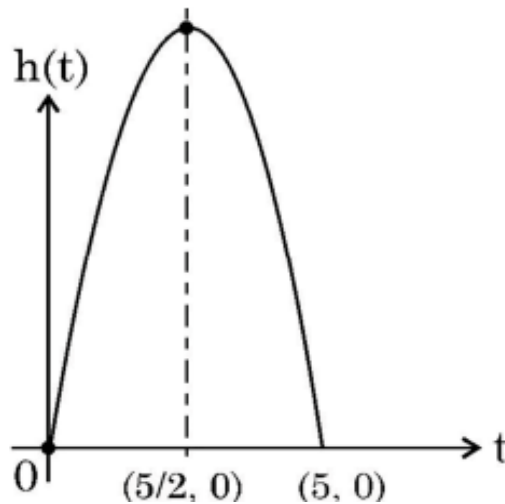
- How many zeroes are there for the polynomial represented by the graph given? (1)
- Write the zeroes of the polynomial. (1)
- If the zeroes of a polynomial $x^2 + (a + 1)x + b$ are 2 and -3 , then determine the values of a and b . (2)

OR

If the square of difference of the zeroes of the polynomial $x^2 + px + 45$ is 144, then find the value of p . (2)

23. Read the following text carefully and answer the questions that follow:

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:

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

OR

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

Polynomials Paper Details – Analysis		
Objective Questions		
MCQ	1 marks x 8 question = 8	
Assertion Reason	1 marks x 2 question = 2	
Subjective		
Short type I	2 marks x 5 question = 10	
Short type II	3 marks x 4 question = 12	
Long Type	5 marks x 2 question = 10	
Case Studies Based		
Case 1	4 marks	
Case 2	4 marks	

Total = 50 marks Your Score =