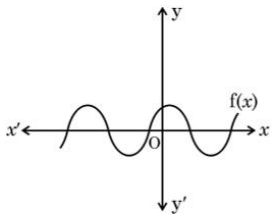
SNS ACADEMY

Polynomials Worksheet

CLASS 10 - MATHEMATICS

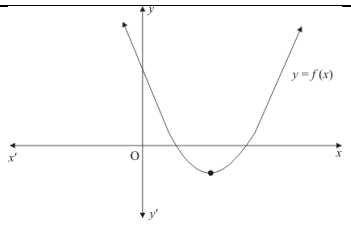
	Section A	
1	If α and β are the zeroes of the polynomial $2x^2 + 5x + 1$, then the value of $\alpha + \beta + \alpha\beta$ is a) - 2 b) 1 c) 3 d) - 1	**[1]**
2	Given that one of the zeroes of the quadratic polynomial $ax^2 + bx +$ cis zero, then the other zero is a) $\frac{-c}{a}$ b) $\frac{b}{a}$ c) $\frac{-b}{a}$ d) $\frac{c}{a}$	**[1]**
3	The zeroes of the quadratic polynomial $x^2 + 99x + 127$ are a) both positive b) both equal c) one positive and one negative d) both negative	**[1]**
4	For what value of k, the product of zeroes of the polynomial $kx^2 - 4x - 7$ is 2? a) $\frac{7}{2}$ b) $-\frac{2}{7}$	**[1]**

	c) $-\frac{1}{14}$ d) $-\frac{7}{2}$	
5	If α and β are the zeroes of the polynomial $ax^2 - 5x + c$ and $\alpha + \beta = \alpha\beta = 10$, then: a) a = 5, c = $\frac{1}{2}$ b) a = $\frac{1}{2}$, c = 5 c) a = $\frac{5}{2}$, c = 1 d) a = 1, c = $\frac{5}{2}$	**[1]**
6	A quadratic polynomial with 3 and 2 as the sum and product of its zeros respectively is a) $x^2 - 3x + 2$ b) $x^2 - 2x - 3$ c) $x^2 - 2x + 3$ d) $x^2 + 3x - 2$	**[1]**
7	A quadratic polynomial whose zeroes are - 8 and 3, is a) $x^2 + 5x + 24$ b) $x^2 + 5x - 24$ c) (x - 8) (x - 3) d) (x + 8) (x + 3)	**[1]**
8	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) $10x^2 + x - 3$	**[1]**
9	What should be added to the polynomial $x^2 - 5x + 4$, so that 3 is the zero of the resulting polynomial?	**[1]**

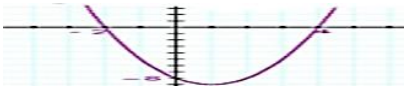
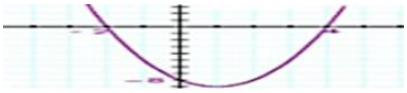
	a) 5 b) 4 c) 2 d) 1	
10	The zeroes of the polynomial p(x) = $25x^2$ - 49 are: a) $\frac{7}{5}, -\frac{7}{5}$ b) $\frac{7}{5}, \frac{7}{5}$ c) $-\frac{49}{25}, +\frac{49}{25}$ d) $\frac{49}{25}, \frac{49}{25}$	**[1]**
11	The graph of y = f(x) is shown in the figure for some polynomial f(x).  The number of zeroes of f(x) is a) 6 b) 4 c) 8 d) 5	**[1]**
12	A quadratic polynomial whose product and sum of zeroes are $\frac{1}{3}$ and $\sqrt{2}$ respectively is a) $3x^2$ - x + $3\sqrt{2}x$ b) $3x^2$ + x - $3\sqrt{2}x$ c) $3x^2 + 3\sqrt{2}x + 1$ d) $3x^2$ - $3\sqrt{2}x + 1$	**[1]**
13	If α, β are the zeroes of the polynomial p(x) = $4x^2$ - 3x - 7, then $\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$ is equal	**[1]**

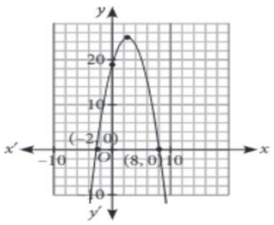
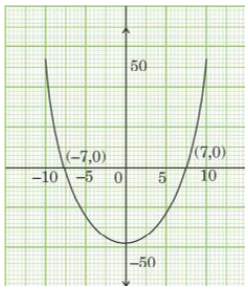
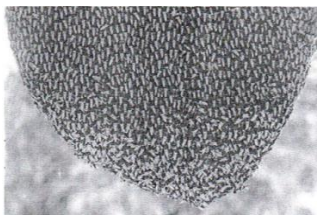
	to: a) $\frac{3}{7}$ b) $\frac{-7}{3}$ c) $\frac{-3}{7}$ d) $\frac{7}{3}$	
14	If one zero of the polynomialf(x) = $(k^2 + 4)x^2 + 13x + 4k$is reciprocal of the other, thenk= a) 1 b) - 2 c) 2 d) - 1	**[1]**
15	A quadratic polynomial whose zeroes are 3 and - 2, is: a) $2x^2 - x - 12$ b) $x^2 + x + 6$ c) $x^2 - x - 6$ d) $x^2 + x - 6$	**[1]**
16	Ifα , β are the zeros of the polynomial $x^2 + 6x + 2$ then $\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$ = ? a) 12 b) - 3 c) - 12 d) 3	**[1]**
17	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) 2 b) 0 c) 1	**[1]**

	d) - 1	
18	If one of the zeroes of a quadratic polynomial of the form x^2 +ax + b is the negative of the other, then it a) has no linear term and the constant term is negative. b) can have a linear term but the constant term is positive. c) can have a linear term but the constant term is negative. d) has no linear term and the constant term is positive.	**[1]**
19	The product of the two zeroes of the polynomial $3x^2$ - 7x - 27 is: a) 27 b) - 9 c) $\frac{7}{3}$ d) 9	**[1]**
20	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	**[1]**
21	Ifα and β are the zeros of the quadratic polynomial f(x) = x^2 - p(x + 1) - c, show that $(\alpha + 1)(\beta + 1) = 1 - c$.	**[2]**
22	Ifα and β are the zeros of the quadratic polynomial f(x) = ax^2 +bx + c, then evaluate: $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$.	**[2]**
23	Find the zeroes of the quadratic polynomial x^2 + 7x + 10, and verify the relationship between the zeroes and the coefficients.	**[2]**
24	α, β are zeroes of the quadratic polynomial x^2 - (k + 6)x + 2(2k - 1). Find the value of k if $\alpha + \beta = \frac{1}{2}\alpha\beta$.	**[2]**
25	The graph of the polynomial f(x) = ax^2 + bx + c is as shown below. Write the sign of c.	**[2]**

		
26	Find a quadratic polynomial, the sum of whose zeroes is 0 and one zero is 5.	**[2]**
27	Find a quadratic polynomial, the sum and product of whose zeroes are 0 and $\sqrt{5}$, respectively.	**[2]**
28	Find the zeros of f(x) = $6x^2$ - 3 - 7x and verify the relationship between the zeros and its coefficients.	**[2]**
29	Find the zeroes of thepolynomial f(u) = $4u^2$ + 8u,and verify the relationship between the zeroes and the coefficients.	**[2]**
30	Find the zeroes of the polynomial p(x) = $2x^2$ - 7x - 15and verify the relationship between its coefficients and zeroes.	**[2]**
31	Ifα and β are the zeroes of the polynomial f(x) = x^2 - 6x + k, find the value of k such that $\alpha^2 + \beta^2 = 40$	**[2]**
32	Ifα and β are the zeroes of the polynomial f(x) = $5x^2$ - 7x + 1, then find the value of $\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)$.	**[2]**
33	Find the zeroes of $4x^2$ +24x + 36and verify the relationship between the zeroes and their coefficients.	**[2]**
34	Find the zeroes of $100x^2$ - 81 and verify the relationship between the zeroes and their coefficients.	**[2]**
35	Ifα and β are the zeros of the quadratic polynomial f(x) = x^2 - x - 4, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$.	**[2]**
36	Ifα and β are zeroes of the quadratic polynomial $4x^2$ + 4x+ 1, then form a quadratic polynomial whose zeroes are 2 α and 2 β .	**[3]**
37	Ifα , β are zeroes of the quadratic polynomial x^2 + 9x + 20, form a quadratic polynomial whose zeroes are (α + 1) and (β + 1).	**[3]**
38	Find a quadratic polynomial whose sum and product of the zeroes are$-\frac{21}{8}$ and $\frac{5}{16}$ respectively.Also find the zeroes of thepolynomialby factorisation.	**[3]**
39	Ifα and β are the zeros of the polynomial f(x) = $6x^2$ + x - 2, find the value of $\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)$	**[3]**
40	Write the family of quadratic polynomials having$-\frac{1}{4}$ and 1 as its zeros.	**[3]**
41	Find the zeros of polynomialp(y) =$y^2 + \frac{3\sqrt{5}}{2}y - 5$ and verify the relationship between the zeros and its coefficients.	**[3]**
42	Ifα and β are the zeros of the quadratic polynomial f(x) = x^2 - 2x + 3, find a	**[3]**

	polynomial whose roots are $\alpha + 2, \beta + 2$	
43	Read the following statement carefully and deduce about the sign of the constants p, q, and r. "The zeroes of a quadratic polynomial $px^2 + qx + r$ are both negatives."	**[3]**
44	Find the zeroes of the polynomial $2s^2 + (1 + 2\sqrt{2})s + \sqrt{2}$ by factorisation method and verify the relationship between the zeroes and coefficient of the polynomial.	**[3]**
45	Find the zeroes of the polynomial $v^2 + 4\sqrt{3}v - 15$ by factorisation method and verify the relationship between the zeroes and coefficient of the polynomials.	**[3]**
46	Find the zeros of $f(x) = x^2 - 2x - 8$ and verify the relationship between the zeros and its coefficients.	**[3]**
47	Find a quadratic polynomial, the sum and product of whose zeroes are $\frac{1}{4}$ and - 1, respectively.	**[3]**
48	Find the zeroes of the given quadratic polynomials and verify the relationship between the zeroes and the coefficients. $6x^2 - 3 - 7x$	**[3]**
49	If $\alpha and \beta$ are the zeroes of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate: $\frac{1}{\alpha} - \frac{1}{\beta}$	**[3]**
50	If α and β are the zeros of the quadratic polynomial $f(x) = ax^2 + bx + c$, then evaluate: $\frac{\beta}{a\alpha+b} + \frac{\alpha}{a\beta+b}$.	**[3]**
51	If $\alpha and \beta$ are the zeroes of the polynomial $p(x) = 6x^2 + 5x - k$ satisfying the relation, $\alpha - \beta = \frac{1}{6}$, then find the value of k.	**[5]**
52	If $\alpha and \beta$ are the zeroes of polynomial $p(x) = 3x^2 + 2x + 1$, find the polynomial whose zeroes are $\frac{1-\alpha}{1+\alpha} and \frac{1-\beta}{1+\beta}$.	**[5]**
53	If α and β are the zeroes of the polynomial $x^2 + 4x + 3$, find the polynomial whose zeroes are $1 + \frac{\beta}{\alpha} and 1 + \frac{\alpha}{\beta}$. .	**[5]**
54	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.	**[5]**
55	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).	**[5]**
56	Without actually calculating the zeroes, form a quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $5x^2 + 2x - 3$.	**[5]**
57	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.	**[5]**
58	If β and $\frac{1}{\beta}$ are zeroes of the polynomial $(\alpha^2 + \alpha)x^2 + 61x + 6\alpha$. Find the values	**[5]**

	of β and α .	
59	Find the zeros of f(v) = v^2 + 4 $\sqrt{3}$ v - 15 and verify the relationship between the zeros and its coefficients.	**[5]**
60	Ifα and β are the zeros of the quadratic polynomial f(x) = ax^2 + bx + c, then evaluate: $a\left(\frac{\alpha^2}{\beta}+\frac{\beta^2}{\alpha}\right)+b\left(\frac{\alpha}{\beta}+\frac{\beta}{\alpha}\right)$	**[5]**
61	Find the zeros of f(s) =$2s^2-\left(1+2\sqrt{2}\right)s+\sqrt{2}$ and verify the relationship between the zeros and its coefficients.	**[5]**
62	Find the zeroes of a quadratic polynomial $2x^2$ + 3x - 14 and verify the relationship between the zeroes and its coefficients.	**[5]**
63	**Read the following text carefully and answer the questions that follow:** An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.   1. Which type the shape of the poses shown in figure? (1) 2. In the graph, how many zeroes are there for the polynomial? (1)  3. Write two zeroes in the shown given graph? (2)  **OR** How many zeroes are possible for a quadratic polynomial? (2)	**[4]**
64	**Read the following text carefully and answer the questions that follow:** Rachna and her husband Amitwho is an architect by profession, visited France. They went to see Mont Blanc Tunnel which is a highway tunnel between France and Italy, under the Mont Blanc Mountain in the Alps, and has a parabolic cross - section. The mathematical representation of the tunnel is shown in the graph.	**[4]**

	  1. What will be the expression of the polynomial given in diagram? (1) 2. What is the value of the polynomial, represented by the graph, when x = 4? (1) 3. If the tunnel is represented by - x^2 + 3x - 2. Then what is its zeroes? (2) **OR** What is sum of zeros and product of zeros for -x^2 + 3x - 2? (2)	
65	**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.   1. How many zeroes are there for the polynomial represented by the graph given? (1)	**[4]**

	2. Write the zeroes of the polynomial. (1) 3. 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)	
66	**Read the following text carefully and answer the questions that follow:** The below picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.  1. In the standard form of quadratic polynomial, $ax^2 + bx + c$, what are a, b and c? (1) 2. If the roots of the quadratic polynomial are equal, what is the discriminant D? (1) 3. If α and $\frac{1}{\alpha}$ are the zeroes of the quadratic polynomial are $2x^2 - x + 8k$, then find the value of k? (2) **OR** What is the relation between zeros and coefficient for a quadratic polynomial? (2)	**[4]**