# Ravi Maths Tuition

**Polynomials**

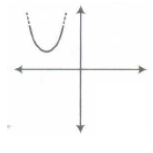
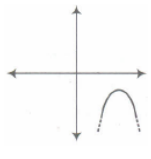
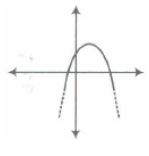
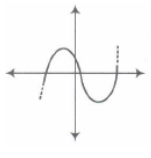
**10th Standard**

**Maths**

Reg.No. : ☐☐☐☐☐☐

Multiple Choice Question 86 x 1 = 86

1) Which of the following is not the graph of a quadratic polynomial?

(a)  (b)  (c)  (d) 

2) If 1 is a zero of the polynomial $p(a)=x^2a^2-2xa+3x-2$ . Then x=

(a) -1, -2 (b) 2, 1 (c) 2,-1 (d) -2, 1

3) The number of polynomials having zeroes -2 and 5 is:

(a) 1 (b) 3 (c) 2 (d) more than 3

4) If $-\sqrt{5}$ and $\sqrt{5}$ are the roots of the quadratic polynomial. Find the quadratic polynomial

(a) (x-5)(x+5) (b) $x^2 - 25$ (c) x-5 (d) $x^2 - 5$

5) If the degree of the dividend is 5 and the degree of the divisor is 3, then the degree of the quotient will be

(a) 0 (b) 2 (c) 1 (d) -2

6) The graph of the polynomial f(x) = 2x – 5 crosses the X-axis at the point

(a) (1, -3) (b) (5/2, 0) (c) (0, 0) (d) (4, 3)

7) The value of p when $x^3 + 9x^2 + px - 10$ is exactly divisible by (x+ 2 ) is ____

(a) 1 (b) 6 (c) 3 (d) 9

8) If the product of two zeros of the polynomial $f(x) = 2x^3 + 6x^2 - 4x + 9$ is 3, then its third zero is

(a) 3/2 (b) 9/2 (c) -9/2 (d) -3/2

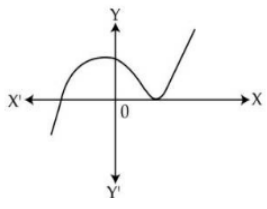
9) The value of quadratic polynomial $f(x)=2x^2- 3x- 2$ at x =-2 is

(a) 15 (b) 16 (c) -12 (d) 12

10) If one root of the equation $(p + q)^2 x^2 - 2 (p + q) x + k =0$ is 5/p+q , then k is

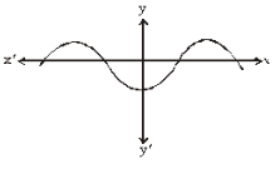
(a) 15 (b) 50 (c) -15 (d) -50

11) The graph of y = p(x) is given below. The number of zeroes of p(x) are




(a) 3 (b) 0 (c) 4 (d) 2

12) The graph y= p(x) is shown below. How many zeroes does the polynomial p(x) have?




(a) 2 (b) 4 (c) 3 (d) 1

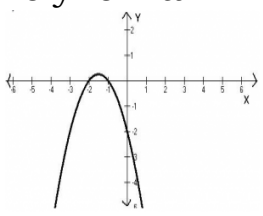
13) Given a polynomial p(x) of degree ‘n’, the graph of y = p(x) intersects the X-axis

(a) at most n points (b) at most n – 1 points (c) at most n + 1 points (d) at most 0 points

14) he degree of the polynomial $8x^3 - 3x^2 + 5x - 9$ is

(a) 3 (b) 0 (c) 1 (d) 2

15) Polynomial will have zeroes



(a) -1 (b) 2 and -1 (c) -2 and -1 (d) -5

16) If one zero of $2x^2 - 3x + k$ is reciprocal to the other, then the value of k is :

(a) -3 (b) 2 (c) -3/2 (d) -2/3

17) If sum of the squares of zeros of the quadratic polynomial $f(x) = x^2 - 8x + k$ is 40, find the value of k.

(a) 14 (b) 12 (c) -14 (d) -12

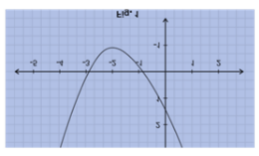
18) If the polynomial (2x + 3 ) is a factor of the polynomial $2x^3 + 9x^2 - x - b$. The value of b is_____

(a) 10 (b) 20 (c) 5 (d) 15

19) α and β are the zeroes of the polynomial $5x^2 - 7x + 2$, then sum of their reciprocals is::

(a) 7/2 (b) 14/25 (c) 7/5 (d) 2/5

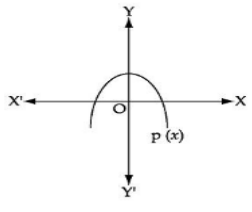
20)



The polynomial drawn in above graph has how many zeros?

(a) 1 (b) 3 (c) 4 (d) 2

21)




In figure, the graph of a polynomial p (x) is shown, the number of zeroes of p (x) is :

(a) 1 (b) 0 (c) 2 (d) None of these

22) If the degree of the divisor g(x) is one then the degree of the remainder r(x) is

(a) 2 (b) 3 (c) 1 (d) 0

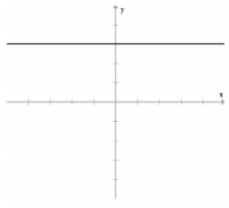
23) When $x^2 - 2x + k$ divides the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$, the remainder is (x + a) . The value of a is_____

(a) 5 (b) -5 (c) -3 (d) 3

24) A fourth degree polynomial is called

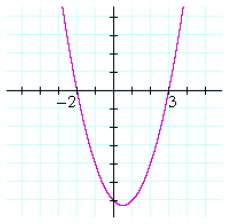
(a) Cubic polynomial (b) A bi-quadratic polynomial (c) Binomial (d) Quadratic polynomial

25) The zero of the polynomial represented by the given graph



(a) Does not exist (b) Is 3 (c) Is y = 3 (d) Is 0

26) The following graph corresponds to a




(a) Linear polynomial (b) Bi- quadratic polynomial (c) Quadratic polynomial (d) Cubic polynomial

27) When $x^3 - 3x^2 + 5x - 3$ is divided by $x^2 - k$ , the remainder is $7x + a$ . Then the value of k is_____

(a) 1 (b) 2 (c) 3 (d) 6

28) $\alpha,\beta,\gamma$ are the zeros of the polynomial $2x^3 + x^2 - 13x + 6$, then the value of $\alpha\beta\gamma$ is

(a) -3 (b) -13/2 (c) 3 (d) 1/2

29) If $(x + 1)$ is a factor of $x^2 - 3ax + 3a - 7$, then the value of a is:

(a) -2 (b) 1 (c) -1 (d) 0

30) If "1" is a zero of the polynomial $P(a) = x^2a^2 - 2xa + 3x - 2$ , then x =

(a) -2 (b) -2, 0 (c) +2, 2 (d) 2

31) Find the zero of a linear polynomial $ax + b$

(a) -b/a (b) a/b (c) b/a (d) -a/b

32) Sum and the product of zeroes of the polynomial $x^2 + 7x + 10$ is

(a) 7 and -10 (b) -7 and 10 (c) 10/7 and -10/7 (d) 7/10 and -7/10

33) A quadratic polynomial____

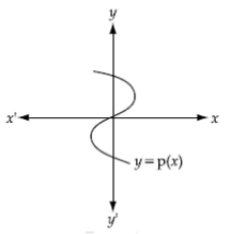
(a) Is always a binomial (b) Is always a Trinomial (c) May be a monomial, binomial or a trinomial

(d) Is always a Monomial

34) The expression that should be added to the polynomial $f(x) = x^4 + 2x^3 - 2x^2 + x + 1$, so that it should be exactly divisible by $(x^2 + 2x - 3)$ is

(a) $2 - x$ (b) $x - 4$ (c) $x^3 - 3$ (d) $x + 2$

35) The number of zeroes for the polynomial $y = p(x)$ from the given graph is :




(a) 2 (b) 3 (c) 0 (d) 1

36) The three zeroes of the polynomial $2x^3 + 5x^2 - 28x - 15$_____

(a) All three are not real numbers (b) Are all Integers (c) Are all rational numbers

(d) Are all Natural numbers

37) If one root of polynomial equation $ax^2+bx+c=0$ be reciprocal of other, then

(a) a = c (b) a = 0 (c) b = 0 (d) b = c

38) If sum of the zeroes of the polynomial is 4 and their product is 4, then the quadratic polynomial is

(a) $x^2 + 2x + 2$ (b) $x^2 + 4x + 4$ (c) $x^2 - 4x + 4$ (d) $x^2 - 2x + 2$

39) Which of the given is the set of zeroes of the polynomial $p(x) = 2x^3+x^2-5x+2$

(a) -1/2, 1, -2 (b) 1/2, -1, -2 (c) -1/2, -1, -2 (d) 1/2, 1, -2

40) value of 'a' so that $(x + 6)$ is a factor of the polynomial $x^3 + 5x^2 - 4x + a$

(a) 10 (b) 12 (c) 13 (d) 0

41) When the polynomial $f(x) = 4x^3 + 8x^2 + 8x + 7$ is divided by the polynomial $g(x) = 2x^2 - x + 1$, the quotient and the remainder are

(a) Quotient = 2x – 5, Remainder = 11x (b) Quotient = 2x + 5, Remainder = 11x + 2

(c) Quotient = $x^2$ – 5, Remainder = 15 (d) Quotient = x -5, Remainder = 13

42) If one zero of the polynomial $x^2$+ kx+18 is double the other zero then k =?

(a) ±3 (b) 9 (c) 3 (d) ±9

43) Find the sum and the product of zeroes of the polynomial $x^2$ +7x +10

(a) 7,-10 (b) -7,-10 (c) -7, 10 (d) 7, 10

44) If two of the zeroes of the polynomial $f(x) = x^4 - 3x^3 - x^2 + 9x - 6$ are $-\sqrt{3}$ and $\sqrt{3}$ then all the zeroes are

(a) $\sqrt{3}$, $-\sqrt{3}$, 1 ,3 (b) -1, 4, $\sqrt{3}$, $-\sqrt{3}$ (c) $\sqrt{3}$, $-\sqrt{3}$, 2, 3 (d) $\sqrt{3}$, $-\sqrt{3}$, 1, 2

45) If α, β and γ are the zeroes of a cubic polynomial then the sum of zeroes of cubic polynomial is given by

(a) α+β+γ= -d/a (b) α+β+γ= c/a (c) α+β+γ= b/a (d) α+β+γ= -b/a

46) The graph of a quadratic polynomial is a parabola which cuts the X- axis at

(a) at most two points (b) four points (c) one point only (d) at most three points

47) If α , β are zeroes of the polynomial $f(x) = x^2 + 5x + 8$, then value of (α + β) is

(a) 8 (b) -8 (c) -5 (d) 5

48) If the two zeroes of the quadratic polynomial $7x^2 - 15x - k$ are reciprocals of each other, the value of k is:

(a) 1/7 (b) 7 (c) -7 (d) 5

49) A polynomial of degree 2 is called a

(a) Quadratic polynomial (b) Binomial (c) Biquadratic polynomial (d) Trinomial

50) If α, β, γ be the zeros of the polynomial p(x) such that α+ β+ γ = 3 , αβ+ βγ+ γα = -10 and αβγ = -24 then p(x) is

(a) $x^3 - 3x^2 - 10x - 24$ (b) $x^3 + 3x^2 - 10x + 24$ (c) $x^3 + 3x^2 + 10x - 24$ (d) $x^3 - 3x^2 - 10x + 24$

51) Find the quadratic polynomial whose zeros are 2 and -6.

(a) $x^2 + 4x - 12$ (b) $x^2 + 4x + 12$ (c) $x^2 - 4x - 12$ (d) $x^2 - 4x + 12$

52) If one of the zeroes of the quadratic polynomial $(k - 1)x^2 + kx + 1$ is -3, then the value of k is

(a) $\frac{4}{3}$ (b) $\frac{-4}{3}$ (c) $\frac{2}{3}$ (d) $\frac{-2}{3}$

53) if $\alpha$ and $\beta$ are zeroes and the polynomial $f(x) = x^2 - x - 4$ value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$

(a) $\frac{15}{4}$ (b) $\frac{-15}{4}$ (c) 4 (d) 15

54) On dividing $x^3 - 3x^2 + x + 2$ by a polynomial g(x), the quotient and remainder were x - 2 and -2x + 4 respectively, then g(x) is equal to

(a) $x^2 + x + 1$ (b) $x^2 + 1$ (c) $x^2 - x + 1$ (d) $x^2 - 1$

55) 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) $2x^2 + 2x - 24$

56) If one of the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$ is zero, the product of then other two zeroes is

(a) $\frac{-c}{a}$ (b) $\frac{c}{a}$ (c) 0 (d) $\frac{-b}{a}$

57) If the square of difference of the zeroes of the quadratic polynomial $x^2 + px + 45$ is equal to 144, then the value of p is

(a) ±9 (b) ±12 (c) ±15 (d) ±18

58) If one of the zeroes of the cubic polynomial $x^3 + ax^2 + bx + c$ is -1, then the product of the other two zeroes is

(a) b - a + 1 (b) b - a -1 (c) a - b + 1 (d) a - b - 1

59) The polynomial [(x) = $ax^3$ + bx - c is divisible by the polynomial $g(x) = x^2 + bx + c$, $c \neq 0$, if

(a) ab = 2 (b) ab = 1 (c) ac = 2 (d) c = 2b

60) If $\alpha$ and $\beta$ are zeroes and the quadratic polynomial $p(S)= 3S^2 - 6S + 4$ , then the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} + 2(\frac{1}{\alpha} + \frac{1}{\beta}) + 3\alpha\beta$ is

(a) 7 (b) 6 (c) 8 (d) 10

61) If a cubic polynomial with the sum of its zeroes, sum of the products and its zeroes taken two at a time and product of its zeroes as 2, -5 and -11 respectively, then the cubic polynomial is

(a) $x^3 + 7x - 6$ (b) $x^3 + 7x + 6$ (c) $x^3 - 7x - 6$ (d) $x^3 - 7x + 6$

62) If one of the zeroes of a quadratic polynomial of the form $x^2 + ax + b$ is the negative of the other, then which of the following is correct?

(a) Polynomial has linear factors (b) Constant term of polynomial is negative

(c) Both (a) and (b) are correct (d) Neither (a) nor (b) is correct

63) If $\alpha \; and \; \beta$ are the zeroes of the quadratic polynomial $f(x) = ax^2 + bx + c$, then the value of $\alpha^4\beta^4$ is

(a) $\frac{(b^2-2ac)2+a^2c^2}{a^4}$ (b) $\frac{(b^2+2ac)2-a^2c^2}{a^4}$ (c) $\frac{(b^2-2ac)2-2a^2c^2}{a^4}$ (d) $\frac{(b^2+2ac)2+2a^2c^2}{a^4}$

64) If the sum of the zetoes of the equation $\frac{1}{x+a} + \frac{1}{x+b} = \frac{1}{c}$ is zero, then the product of zeroes of the equation is?

(a) $\frac{a^2+b^2}{2}$ (b) $-\frac{(a^2+b^2)}{2}$ (c) $\frac{ab}{2}$ (d) $\frac{(a+b)^2}{2}$

65) The difference between two numbers is 642, When the greater is divided by the smaller, the quotient is 8 and the remainder is 19, then find the sum of cube of numbers

(a) 391322860 (b) 319322860 (c) 319322680 (d) 391223860

66) Find the zeroes of the quadratic polynomial $y^2 - 3y + 2$ with the help of the graph.

(a) 1,-2 (b) $\frac{-1}{4}, \frac{3}{2}$ (c) 6,-1 (d) 1,2

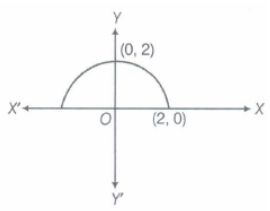
67) Draw the graph of the polynomial- $x^2 + x + 2$ and find the maximum value of the polynomial.

(a) 2 (b) $\frac{5}{2}$ (c) $\frac{9}{4}$ (d) None of these

68) If $\alpha, \beta and \gamma$ are the zeroes of the polynomial $p(x)= ax^3 + 3b^2 + 3cx+ d$ and having relation $2\beta = \alpha + \gamma$ then $2b^3$ - 3 abc + $a^2$d is

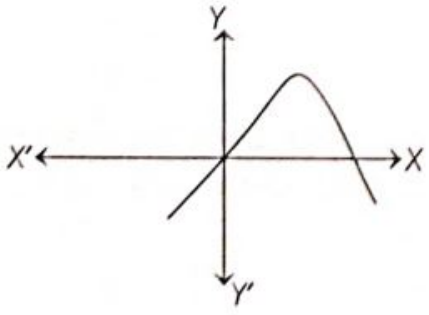
(a) -1 (b) 1 (c) 0 (d) None of the above

69) If a quadratic polynomial curve in the shape of semi-circle is shown below. Then, the equation of this curve.




(a) $-x^2 + 2$ (b) $x^2 + 2$ (c) $\frac{1}{2}x^2 + 2$ (d) $-\frac{1}{2}x^2 + 2$

70) In the given figure, graph of a polynomial f(x) is shown. The number of zeroes of polynomial f(x) is




(a) 3 (b) 1 (c) 0 (d) 2

71) If the two zeroes of a quadratic polynomial are $\pm\sqrt{5}$ , then the quadratic polynomial is

(a) $x^2 + 5$ (b) $(x+\sqrt{5})^2$ (c) $4(x^2 - 5)$ (d) $x^2 - \sqrt{5}$

72) If one zero of the polynomial kx2 +3x+ k is 2, then the value of k is

(a) $-\frac{6}{5}$ (b) $\frac{6}{5}$ (c) $\frac{5}{6}$ (d) $-\frac{5}{6}$

73) What should be added from the polynomial $x^2$ - 5x + 4, so that 3 is the zero of the resulting polynomial?

(a) 1 (b) 2 (c) 4 (d) 5

74) The zeroes of the quadratic polynomial$16x^2$ - 9 are

(a) $\frac{3}{4}, \frac{3}{4}$ (b) $-\frac{3}{4}, \frac{3}{4}$ (c) $\frac{9}{16}, \frac{9}{16}$ (d) $-\frac{9}{16}, \frac{9}{16}$

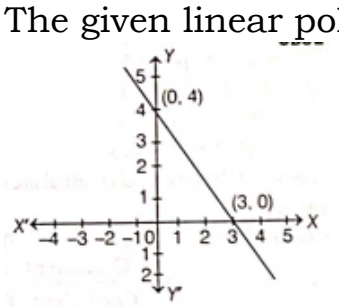
75) If x - 1 is a factor of the polynomial $p(x) = x^3 + ax^2 + 2b$ and a + b = 4,then

(a) a = 5 and b = -1 (b) a = 9 and b = -5 (c) a = 7 and b = -3 (d) a = 5 and b = -1

76) The graph of a polynomial p(x) cuts the X-axis at 3 points and touches it at 2 other points. The number of zeroes of p(x) is

(a) 1 (b) 2 (c) 3 (d) 5

77) The given linear polynomial y = f(x) has




(a) 2 zeroes (b) 1 zero and the zero is 3 (c) 1 zero and the zero is 4 (d) No zero

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

(a) a = -7 and b = -1 (b) a = 5 and b = -1 (c) a = 2 and b = -6 (d) a = 0 and b = -6

79) If α and β are the zeroes of the polynomial $x^2$ - 1, then the value of α + ß is

(a) 2 (b) 1 (c) -1 (d) 0

80) If α, ß are the zeroes of the quadratic polynomial $p(x) = x^2 - (k + 6)x + 2(2k - 1)$,then the value of k, if α + ß = 1/2 αß, is

(a) -7 (b) 7 (c) -3 (d) 3

81) If the square of difference of the zeroes of the quadratic polynomial $x^2 + px + 45$ is equal to 144, then the value of p is

(a) ±9 (b) ±12 (c) ±15 (d) ±18

82) If one of the zeroes of the cubic polynomial ax + bx + cx + d is zero, then product of other two zeroes is

(a) $\frac{-c}{a}$ (b) $\frac{c}{q}$ (c) 0 (d) $\frac{-b}{a}$

83) The quadratic polynomial, the sum of whose zeroes is -5 and their product is 6, is

(a) $x^2 + 5x + 6$ (b) $x^2 - 5x + 6$ (c) $x^2 - 5x - 6$ (d) $-x^2 + 5x + 6$

84) If a cubic polynomial with the sum of its zeroes,sum of the products of its zeroes taken two at a time and product of its zeroes are 0, -7 and -6 respectively, then the cubic polynomial is

(a) $x^3 + 7x - 6$ (b) $x^3 + 7x + 6$ (c) $x^3 - 7x - 6$ (d) $x^3 - 7x + 6$

85) 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, $\frac{3}{2}$

86) What should be subtracted from the polynomial $x^2 - 16x + 30$, so that 15 is the zero of the resulting polynomial?

(a) 30 (b) 14 (c) 15 (d) 16

True or False 5 x 1 = 5

87) Every polynomial has atmost one zeroes

(a) True (b) False

88) The number of polynomials having 5 and -3 as zeroes are infinite

(a) True (b) False

89) If p(x)and g(x) are any two polynomials with g(x) $\neq$ 0, then we can find polynomials g(x) and r(x), such that p(x) = g(x) x q(x)+ r(x), where r(x) = 0 or degree of r(x) < degree of g(x).

(a) True (b) False

90) Sum of zeroes of $4X^2$ -15x + 10 is 3.

(a) True (b) False

91) Graph of polynomial $x^2 + 6x + 9$ intersects the X-axis at two points.

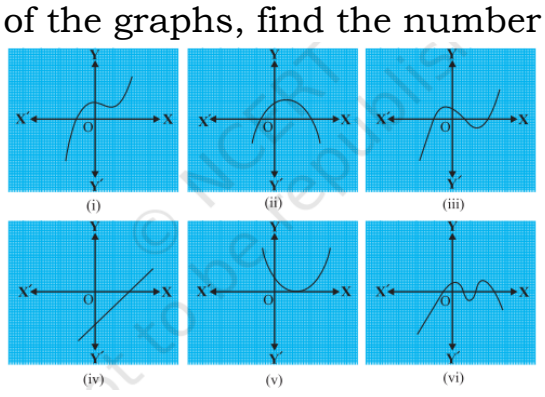
(a) True (b) False

Match the following 4 x 1 = 4

| | |
|---|---|
| 92) If P and q are zeroes of $3x^2 + 2x - 9$, then value of p-q is | (1) $4X^2$ -8x-5 |
| 93) The polynomial whose zeroes are $(\sqrt{2} + 1)$ and $(\sqrt{2} - 1)$ is | (2) $x^2 - 2\sqrt{2}x + 1$ |
| 94) The polynomial whose zeroes are $\frac{5}{2} and \frac{-1}{2}$ | (3) $\frac{3}{5}$ |
| 95) If the sum of the zeroes of the quadratic polynomial p(x) = $kx^2$ - 3x + 5k is equal to their product, then find value of k. | (4) $\pm\frac{4\sqrt{7}}{3}$ |

2 Marks 159 x 2 = 318

96) Look at the graphs in Fig. given below. Each is the graph of y = p(x), where p(x) is a polynomial. For each of the graphs, find the number of zeroes of p(x)




97) Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients.

98) Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively.

$\frac{1}{4}, -1$

99) Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively.

$\sqrt{2}, \frac{1}{3}$

100) Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively.
$0, \sqrt{5}$

101) Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively.
1, 1

102) Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively.
$-\frac{1}{4}, \frac{1}{4}$

103) Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively.
4, 1

104) Identify the type of the polynomial given below (on the basis of degree).
$3x^2+4x+c$

105) Identify the type of the polynomials given below:
$f(p) = 3 - p^2 + \sqrt{7}p$

106) For what value of k, 3 is a zero of the polynomial $2x^2+x+k$?

107) If 2 is a zero of polynomial $f(x)=ax^2-3(a-1)x-1$, then find the value of a.

108) If 2 and 3 are zeroes of polynomial $3x^2-2kx+2m$, then find the values of k and m

109) Represent the following quadratic polynomial on the graph and also find the zeroes of the polynomial $-x^2+x+6$

110) If zeroes α and β of a polynomial $x^2-7x+k$ are such that $\alpha-\beta=1$, then find the value of k.

111) If α and β are the zeroes of the quadratic polynomial $f(x)=3x^2-5x-2$, then evaluate $\alpha^3+\beta^3$.

112) If α and β are the zeroes of the polynomial $2y^2+7y+5$, then find the value of $\alpha+\beta+\alpha\beta$.

113) Divide the polynomial p(x) by the polynomial g(x) and verify the division algorithm in following.
$p(x)=2x^4-2x^3-5x^2-x+8$, $g(x)=2x^2+4x+3$

114) If the product of the zeroes of the polynomial $(ax^2-6x-6)$ is 4, then find the value of a.

115) Write whether the following expressions are polynomials or nt. Give reasons for your answer.
(i) $x^3 + \frac{1}{x^2} + \frac{1}{x} + 1$
(ii) $x^2+x+3$
(iii) $y^{-12}-3y+2$
(iv) $\sqrt{2}y^3 + \sqrt{3}y$

116) If one zero of the polynomial $(a^2+9)x^2+13x+6a$ is a reciprocal of the other, then find the value of a.

117) Find the zeroes of the quadratic polynomial $(x^2+5x+6)$ and verify the relation between the zeroes and the coefficients.

118) Find the quadratic polynomial, sum of whose zeroes is 8 and their product is 12. Hence, find the zeroes of $3 - \sqrt{2}$ .

119) Find a quadratic polynomial with zeroes $3 + \sqrt{2}$ and $3 - \sqrt{2}$ .

120) If α and β are zeroes of the quadratic polynomial $p(x)=x^2-(k+6)x+2(2k-1)$, then find the value of k, if $a + \beta = \frac{a\beta}{2}$ .

121) If the zeroes of the polynomial $x^2+px+q$ are double in value to the zeroes of $2x^2-5x-3$, then find the values of p and q.

122) For a quadratic polynomial, whose one zero is 8 and the product of zeroes is -56.

123) Find the zeroes of the quadratic polynomial $3x^2+11x-4$, then find the value of $\frac{m}{n}+\frac{n}{m}$ .

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

125) The sum and the product of a zeroes of the polynomial $f(x)=4x^2-27x+3k^2$ are equal. Find the value of k.

126) If α and β are zeroes of the quadratic polynomial $f(x)=x^2-5x+k$, such that $\alpha-\beta=1$, then find the value of k.

127) Write the zeroes of $100x^2-81$

128) If 1 a zero of polynomial $p(x)=ax^2-3(a-1)$, then find the value of a.

129) Find the sum of the zeroes of quadratic polynomial $x^2+7x+10$.

130) Is x=-4, a solution of the equation $2x^2+5x-12=0$?

131) For what value of k, -4 is a zero of the polynomial $x^2-x-(2k+2)$?

132) For what value of k, -2 is a zero of the polynomial $3x^2+4x+2k$?

133) If α and β are the zeroes of the quadratic polynomial $p(x)=4x^2-5x+1$, then find the value of $\alpha^2\beta+\beta^2\alpha$.

134) For what value of k, 3 is zero of the polynomial $2x^2+x+k$?

135) If α, β and ϒ are zeroes of the polynomial $2x^3+x^2-13x+6$, then evaluate (αβ+βϒ+ϒα).

136) Find the quadratic polynomial whose zeroes are $\sqrt{3}+\sqrt{5}$ and $\sqrt{5}-\sqrt{3}$

137) If α and β are zeroes of a polynomial, such that α+β=6 and αβ=4, then write the polynomial.

138) Is the following statement True or False? Justify your answer. 'If the zeroes of a quadratic polynomial $ax^2+bx+c$ are both negative, then a, b and c all have the same sign.'

139) If one zero of $2x^2-3x+k$ is reciprocal to the other, the find the valu of k.

140) If the sum of the squares of zeroes of the quadratic polynomial $f(x)=x^2-4x+k$ is 20, then find the value of k.

141) If the zeroes of the quadratic polynomial $ax^2+bx+c$, where $c\neq 0$, are equal, then show that c and a have same sign.

142) Can (x-1) be the remainder on division of a polynomial, p(x) by (2x+3)? Justify your answer.

143) The sum of remainders obtained when $x^3+(k+8)x+k$ is divided by x-2 and when is divided by x+1, is 0. Find the value of k.

144) If $\alpha$ and $\beta$ are the roots of $ax^2 - bx + c = 0$ $(a \neq 0)$ , then calculate $\alpha+\beta$ .

145) If sum of the zeroes of the quadatic polynomial $3x^2 - kx + 6$ is 3, then find the value of k.

146) If - 1 is a zero of the polynomial $f(x) = x^2 - 7x - 8$, then calculate the other zero.

147) If zeroes of the polynomial $x^2 + 4x + 2a$ are $\alpha$ and $\frac{2}{\alpha}$ , then find the value of a.

148) Find all the zeroes of $f(x) = x^2 - 2x$

149) Find the zeroes of the quadratic polynomial $\sqrt{3}x^2 - 8x + 4\sqrt{3}$

150) Find a quadratic polynomial, the sum and product of whose zeroes are 6 and 6 respexctively. Hence find the zeroes.

151) Find the quadratic polynomial whose sum and product of the zeroes are $\frac{21}{8}$ and $\frac{5}{16}$ respectively.

152) Form a quadratic polynomial p(x) with 3 and $-\frac{2}{5}$ as sum and product of its zeroes, respectively.

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

154) If p,q are zeroes of polynomial $f(x) = 2x^2 - 7x + 3$, find the value of $p^2 + q^2$.

155) Find the condition that zeroes of polynomial $p(x) = ax^2 + bx + c$ are reciprocal of each other.

156) Find the value of k, if - 1 is a zero of the polynomial p(x) = $kx^2$ - 4x + k.

157) If $\alpha$ and $\beta$ are the zeroes of a polynomial $x^2 - 4\sqrt{3}x + 3$ , then find the value of $\alpha + \beta - \alpha\beta$

158) Find the values of a and b, if they are the zeroes of polynomial $x^2$ + ax + b.

159) If $\alpha$ and $\beta$ are the zeroes of the polynomial f(x) = $x^2$ - 6x + k, find the value of k, such that $\alpha^2 + \beta^2 = 40$

160) If one of the zeroes of the quadratic polynomial f(x) = $14x^2$ - $42k^2$x - 9 is negative of the order, find the value of 'k'.

161) If one zero of the polynomial $2x^2$ + 3x + $\lambda$ is $\frac{1}{2}$ , find the value of $\lambda$ and other zero.

162) If $\alpha$ and $\beta$ are zeroes of the polynomial f(x) = $x^2$ - x - k, such that $\alpha - \beta = 9$ , find k.

163) If the zeroes of the polynomial $x^2$ + px + q are double in value to the zeroes of $2x^2$ - 5x - 3, find the value of p and q.

164) Find the value for k for which $x^4$ + $10x^3$ + $25x^2$ + 15x + k is exactly divisible by x + 7.

165) If $\alpha$ and $\beta$ are the zeroes of the polynomial $2x^2$ - 4x + 5, find the value of :

(i) $\alpha^2 + \beta^2$
(ii) $\frac{1}{\alpha} + \frac{1}{\beta}$
(iii) $(\alpha - \beta)^2$
(iv) $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$
(v) $\alpha^3 + \beta^3$

166) If the squared difference of the zeroes of the quadratic polynomial f(x) = $x^2$ + px + 45 is equal to 144, find the value of p.

167) It p(x) is a non zero polynomial and p($k^2$) = 0, where k is a real number then what is the least degree of p(x)?

168) The graph of a polynomialp{x) does not intersects the x-axis but intersects y-axis in one point. Find the number of zeroes of p(x).

169) If α and β are the zeroes of the quadratic polynomial f(x) = $x^2$ - px + q, then find the value of $\alpha^2$ + $\beta^2$.

170) If α and β are the zeroes of the quadratic polynomial f(x) =$ax^2$ + bx + c, find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$

171) If α, β are the zeroes of the polynomial p(x)=$x^2$ -p(x + 1) - c suchthat(α + 1)(B + 1) = 0. What is the value of c ?

172) Find the zeroes of the quadratic polynomials and verify the relationship between the zeroes and their coefficients P(x) = $25x^2$ + 5x

173) Find the zeroes of the quadratic polynomials and verify the relationship between the zeroes and their coefficients $p(y) = 4\sqrt{3}y^2 + 5y - 2\sqrt{3}$

174) Find a quadratic polynomial whose zeroes are 3 + √5 and 3 - √5

175) Findaquadraticpolynomialrvhoseonezerois -8 and sum of zeroes is 0.

176) Find a quadratic polynomial whose one zero is -5 and product of zeroes is 0

177) Form a quadratic polynomial, one of whose zero is 2 + √5 and the sum of zeroes is 4

178) Find a quadratic polynomial whose zeroes are 1 and -3.Verify the relation between the coefficients and zeroes of polynomial.

179) Write a quadratic polynomial whose one zero is 3 -√5 and product of zeroes is 4.

180) Form a quadratic polynomial whose zeroes are $\frac{3-\sqrt{3}}{5}$ *and* $\frac{3+\sqrt{3}}{5}$

181) α, β are zeroes of the quadratic polynomial $x^2$ - (k + 6)x + 2(2k - 1).Find the value of k if $\alpha + \beta = \frac{1}{2}\alpha\beta$

182) m, n are zeroes of $ax^2 - 5x + c$. Find the value of a andcifm+n=m.n=10.

183) α and $\frac{1}{\alpha}$ are zeroes of polynomial $4x^2 - 2x + (k - 4)$.Find the value of k.

184) If α, β are zeroes of $x^2 + 5x + 5$, find the value of $\alpha^{-1} + \beta^{-1}$.

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

186) Check whether the g(x) is a factor of the p(x) by applying the division algorithm.
$p(x)=2x^2 - 4x^3 + 2x^2 + 5x + 1, g(x)=x^3 - 4x + 1$

187) General form of a quadratic polynomial is.....

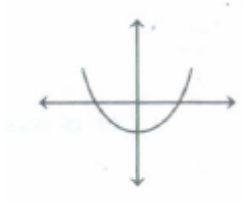
188) Graph of a quadratic polynomial meet X-axis at ..... points.

189) A polynomial of degree n has atmost .....zeroes

190) If a and are the zeroes of the quadratic polynomial $ax^2 + bx + c$, a 0, the $\alpha + \beta$ = _____and $\alpha\beta$ = _____

191) If $\alpha, \beta$ are the zeroes of a polynomial, such that $\alpha + \beta$ = 7 and $\alpha\beta$ = 5, then the polynomial is

192) The graph of a polynomial [(x)is as given in the figure, the number of zeroes is.....



193) What should be added to polynomial $x^2 - 5x + 5$, so that 3 is the zero of the resulting polynomials, is.....

194) If the zeroes of the cubic polynomial $x^3 - 6x^2 + 3x + 10$ are of the form a, a + b and a + 2b for some real numbers a and b, then find the values of a and b.

195) A group of 18 average students and 7 best students of a class. Write a quadratic polynomials whose are equal to number of average students and number of best students

196) The sum of remainders obtained when $x^3 + (k + 8)x + k$ is divided by x - 2 and when it is divided by x + 1, is 0.Find the value of k.

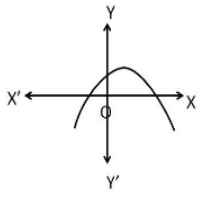
197) Sum of zeroes of the polynomial $3x^2 - 10x + 13$ is 5. Aryan at once said, 'it is false'. Do you agree with Aryan? Justify

198) If one zero of the polynomial $(a^2 + 4)x^2 + 9x + 4a$ is the reciprocal of the other, find the value of a.

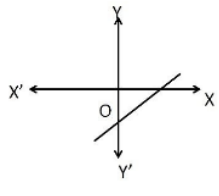
199) Find the degree of the following polynomial:
$7y^5+6y^2-1$

200) Give example of polynomial p (x), g(x), q (x and r (x) , which satisfy the division algorithm and deg p(x) = deg q(x)

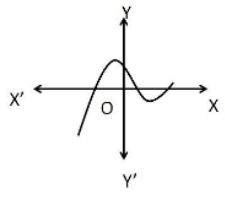
201) Look at the graphs in Figure given below. Each is the graph of y = p(x), where p(x) is a polynomial. For each of the graphs, find the number of zeroes of p(x).



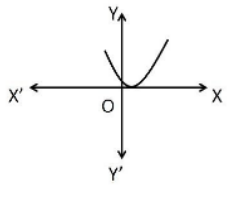

202) Look at the graphs in figure given below. Each is the graph of y = p(x), where p(x) is a polynomial. For each of the graphs, find the number of zeroes of p(x)



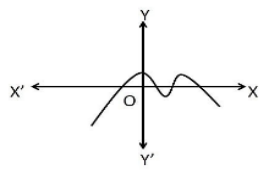
203) Look at the graphs in figure given below. Each is the graph of y = p(x), where p(x) is a polynomial. For each of the graphs, find the number of zeroes of p(x).




204) Look at the graphs in figure given below graph of y=p(x) is a polynomial. The graphs, find the number of zeroes of p(x)




205) Look at the graphs in figure given below graph of y=p(x) is a polynomial. The graphs, find the number of zeroes of p(x)




206) Write the degree of the following polynomials.
$x^3$-3

207) Identify the type of the polynomial given below (on the basis of degree).
$3y^3-4y^2+2y$

208) Identify the type of the polynomial given below (on the basis of degree).
6y+5

209) Identify the type of the polynomial given below (on the basis of degree).
$3+2z+4z^4$

210) Identify the type of the polynomial given below (on the basis of degree).
$\sqrt{3}y^2 - \frac{3}{4}y + 7$

211) Identify the type of the polynomial given below (on the basis of degree).
$3 - \sqrt{2}x^3 + \frac{2}{7}x - 4x^2$

212) Find the degree of the following polynomial:
$\frac{y^2+3y^2+y}{y}$

213) Find the degree of the following polynomial:
$3x^2+7x+2$

214) Find the degree of the following polynomial:
$\frac{t^8-3t^7+2t^5-6t^2}{t^2}$

215) Find the degree of the following polynomial:
-x + 1

216) Find the degree of the following polynomial:
$-10x^2 + 10x$

217) Identify the type of the polynomials given below:
$p(v) = \sqrt{3v^4} - \frac{2}{3}v + 7$

218) Identify the type of the polynomials given below:
$q(x) = \frac{\sqrt{2}}{5}x^3 + 1$

219) Identify the type of the polynomials given below:
r (x) = 3x + 4

220) Identify the type of the polynomials given below:
$p(z) = \sqrt{5}z + 2\sqrt{2}$

221) Identify the type of the polynomials given below:
$r(t) = \frac{-t+3t^2-4t^3}{t}$

222) Draw the graph of the following linear polynomials and also find the zeroes of the given polynomial.
x+5

223) Draw the graph of the following linear polynomials and also find the zeroes of the given polynomial
6x-3

224) Draw the graph of the following linear polynomials and also find the zeroes of the given polynomial
$-\frac{7}{2}x + 7$

225) Draw the graph of the following linear polynomials and also find the zeroes of the given polynomial
-13x

226) Draw the graph of the following linear polynomials and also find the zeroes of the given polynomial
12x-12

227) Represent the following quadratic polynomial on the graph and also find the zeroes of the polynomial
$x^2$-6x+9

228) Represent the following quadratic polynomial on the graph and also find the zeroes of the polynomial
$y^2$ -4

229) Represent the following quadratic polynomial on the graph and also find the zeroes of the polynomial
$3z^2$-z

230) Represent the following quadratic polynomial on the graph and also find the zeroes of the polynomial
$6x^2$-7x+2

231) Represent the following quadratic polynomial on the graph and also find the zeroes of the polynomial
-$2x^2$+5x+7

232) Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients of the polynomial.
$5x^2$ -8x - 4

233) Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients of the polynomial.
$x^2$ -20x + 91

234) Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients of the polynomial.
$x^2 - (\sqrt{2}+1)x + \sqrt{2}$

235) Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients of the polynomial.
a($x^2$+ 1) - x($a^2$ + 1)

236) Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients of the polynomial.
$2\sqrt{3}x^2 - 5x + \sqrt{3}$

237) Find a quadratic polynomial, the sum and product of whose zeroes are, respectively
0 and $-\sqrt{2}$

238) Find a quadratic polynomial, the sum and product of whose zeroes are, respectively
$2 + \sqrt{3}$ and $2 - \sqrt{3}$

239) Find a quadratic polynomial, the sum and product of whose zeroes are, respectively
$x^2 - 2\sqrt{5}x - \sqrt{5}$

240) Find a quadratic polynomial, the sum and product of whose zeroes are, respectively $\frac{3}{2}$ and $-\frac{1}{2}$

241) Apply division algorithm, to find the quotient and remainder on dividing polynomial p(x) by the polynomial g(x). Also, verify the division algorithm.
$p(x) = 10x^4 + 17x^3 - 62x^2 + 30x - 3, g(x) = 2x^2 + 7x - 1$.

242) Apply division algorithm, to find the quotient and remainder on dividing polynomial p(x) by the polynomial g(x). Also, verify the division algorithm.
$p(x) = 3x^3 + 4x^2 + 6x + 9, g(x) = x^2 + 3x + 7$.

243) Find all the zeroes of the following polynomials, when one of its zeroes is given $p(x) = x^3 - 8x^2 + 19x - 12$, having one of its zeroes as 4.

244) Find all the zeroes of the following polynomials, when one of its zeroes is given
$p(x) = x^2 + (3 - \sqrt{2})x - 3\sqrt{2}$ having one of its zeroes as $\sqrt{2}$ .

245) Find all the zeroes of the following polynomials, when one of its zeroes is given $p(x) = 2x^3 + x^2 2 - 7x - 6$, having one ofits zeroes as 2.

246) Obtain all zeroes of the following polynomial, when two of its zeroes are given $p(x) = 2x^4 + x^3 - 14x^2 - 19x - 6$ having two of its zeroes as -2 and -1.

247) Obtain all zeroes of the following polynomial, when two of its zeroes are given $p(x) = x^4 + 4x^3 - 2x^2 - 20x - 15$, having two of its zeroes as $\sqrt{5}$ and $-\sqrt{5}$

248) Obtain all zeroes of the following polynomial, when two of its zeroes are given $p(x) = 8x^4 + 8x^3 - 18x^2 - 20x - 5$, having two of its zeroes as $\sqrt{\frac{5}{2}}$ and $-\sqrt{\frac{5}{2}}$

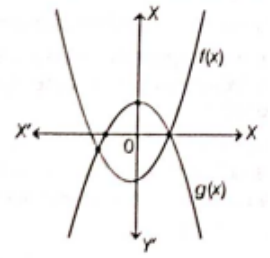
249) Obtain all zeroes of the following polynomial, when two of its zeroes are given $p(x) = 15x^4 - 41x^2 + 28$, having two of its zeroes as $\frac{2}{\sqrt{3}}$ and $-\frac{2}{\sqrt{3}}$

250) Obtain all zeroes of the following polynomial, when two of its zeroes are given $p(x) = x^4 + 7x^3 + 7x^2 - 35x - 60$, having two of its zeroes as -3 and - 4.

251) Find the degree of the polynomial
$\frac{-t^9 + 4t^6 + 7t^5}{t^5}$

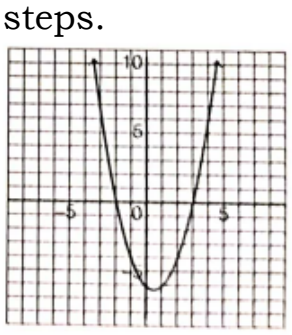
252) Find the zeroes of the polynomial $x^2 + 4x - 12$

253) Two polynomials are shown in the graph below.




Find the number of zeroes that are common to both the polynomials. Explain your answer

254) Use the relationship between the zeroes and coefficients of a polynomial to find the value ofk. Show your steps.




Write a quadratic polynomial whose sum of zeroes is less than that of the polynomialshown in the graph above.

3 Marks 95 x 3 = 285

255) Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients.
$4u^2 + 8u$

256) Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroe and the coefficients.
$t^2 - 15$

257) Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients
$3x^2 - x - 4$

258) Write the degree of the following polynomials.
$7q^6 + 4q^2 + \frac{3}{2} + q - 8$

259) If (x)=ax+b, then find the zero of f (x).

260) If 2 is a zero of polynomial $p(x)=4x^2+2x-5a$, then find the value of a.

261) Find the value of 'a' if X+a is a factor (zero) of the polynomial $2x^2+2ax+5x+10$.

262) If zeros of the polynomial $x^2+(a+1)x+b$ are 2 and -3, then find the value of (a+b).

263) Find the zeros of the quadratic polynomial $x^2$ +7x+10 and verify relationship between the zeros and the coefficients.

264) If a and β are zeroes of the polynomial $x^2-P(x+1)+c$ such that (a+1) (β+1)=0, then find the value of c.

265) Find a quadratic polynomial whose one zero is 7 and sum of zeroes is -18.

266) If a and β are the zeroes of the quadratic polynomial $p(x)=ax^2+bx+c$, then evaluate $a^2\beta+a\beta^2$ .

267) If a and β are the zeroes of the quadratic polynomial $f(x)=ax^{2+bx+c}$, then find the difference between the zeroes.
$(\alpha-\beta)^2 = (\alpha+\beta)^2 - 4\alpha\beta \quad or \quad (\alpha-\beta) = \pm\sqrt{(\alpha+\beta)^2 - 4\alpha\beta}$

268) If one zero of the polynomial $2x^2-5x-(2k+1)$ is twice the other, then find both the zeroes of the polynomial and the value of k.

269) If α and β are zeroes of a quadratic polynomial $x^2$ -5, then form a quadratic polynomial whose zeroes are 1+α and 1+β.

270) Find the cubic polynomial whose three zeroes are 3,-1 and -1/3.

271) Find a cubic polynomial with the sum, sum of the product of its zeroes taken two at a time and the product of its zeroes as 2, -7, -14, respectively.

272) Find the zeroes of the given polynomial by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials $7y^2 - \frac{11}{3}Y - \frac{2}{3}$

273) Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and their coefficients. $q(x) = \sqrt{3x^2} + 10x + 7\sqrt{3}$

274) Can the quadratic polynomial $x^2+kx+k$ have equal zeroes for some odd integer k > 1?

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

276) It is given that 1 is one of the zeroes of the polynomial $7x-x^3-6$. Find its other zeroes.

277) Given that, $x^2+2x-3$ is a factor of $f(x)=x^4+6x^3+2a^{x2}+bx-3a$. Find the values of a and b.

278) Find the zeroes of polynomial $4\sqrt{3x^2} + 5x - 22\sqrt{3}$ and verify the relation between the zeroes and coefficient of the polynomial.

279) Divide $x^4-3x^2+4x+5$ by $x^2-x+1$ and find its quotient and remainder.

280) If α and β are zeroes of the polynomial $21y^2-y-2$, then find a quadratic polynomial, whose zeroes 2α and 2β.

281) If the sum of the zeroes of the polynomial $p(x)=(a+1)x^2+(2a+3)x+(3a+4)$ is -1, then find the product of its zeroes.

282) Find the quadratic polynomial, whose zeroes are in the ratio 2:3 and their sum is 15.

283) Find a quadratic polynomial, whose sum and product of the zeroes are $-\frac{8}{3}$ and $\frac{4}{3}$, respectively. Also, find the zeroes of this polynomial by factorisation.

284) Divide the polynomial $6x^2-44x^2++6x-3$ by polynomial $x^2-3x+1$ and verify the division algorithm.

285) Find the values of a and b, so that $x^4+x^3+8x^2+ax+b$ is divisible by $x^2+1$.

286) What must be added to $f(x)=4x^4+2x^3-2x^2+x-1$, so that the resulting polynomial is divisible by $g(x)=x^2+2x-3$?

287) Given that, $\sqrt{2}$ is a zero of the cubic polynomial $6x^3+\sqrt{2x^2}-10x-4\sqrt{2}$. Find its other two zeroes.

288) For which values of a and b, the zeroes of $q(x)=x^3+2x^2+a$ are also the zeroes of the polynomial $p(x)=x^5-x^4-4x^3+3x^2+3x+b$?

289) What should be added in the polynomial $x^3+2x^2-9x+1$, so that it is completely divisible by $x+4$.

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

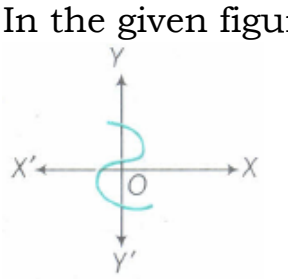
291) If the polynomial $x^4-6x^3+16x^2-25x+10$ is divided by another polynomial $x^2-2x+k$, the remainder comes out to be x+a, then find k and a.

292) Represent the linear polynomials 2x + 3 on the graph paper and find the zero.

293) Represent the quadratic polynomial $x^2$ - 4x -5 on the graph paper and find the zeroes.

294) Represent the cubic polynomial $x^3$ - 4x on the graph paper and find the zeroes.

295) In the given figure, the graph of a polynomial p(x) is shown. Find the number of zeros of P(x).




296) If zeroes of the polynomial $x^2$ + 4x + 2a are $\alpha$ and $\frac{2}{\alpha}$, then find the value of a.

297) Verify whether 2, 3 and $\frac{1}{2}$ are the zeroes of the polynomial $p(x) = 2x^3$ - $11x^2$ + 17x - 6.

298) If the sum and product of the zeroes of the polynomial $ax^2$ - 5x + c is equal to 10 each, find the value of 'a' and 'c'.

299) If one zero of a polynomial $3x^2$ - 8x + 2k + 1 is seven times the other, find the value of k.

300) Quadratic polynomial $2x^2$ - 3x + 1 has zeroes as $\alpha$ and $\beta$. Now form a quadratic polynomial whose zeroes are $3\alpha$ and $3\beta$.

301) If $\alpha$ and $\beta$ are the zeroes of the polynomial $6y^2$ - 7y + 2, find a quadratic polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$

302) If $\alpha$ and $\beta$ are zeroes of the polynomial $p(x) = 3x^2$ - 4x - 7 then form a quadratic polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.

303) If $\alpha$ and $\beta$ are the zeroes of the polynomial $x^2$ + 8x + 6 from a quadratic polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$

304) Show that $\frac{1}{2}$ and $\frac{-3}{2}$ are the zeroes of the polynomial $4x^2$ + 4x - 3 and verify the relationship between zeroes and coefficients of the polynomial.

305) Find the zeroes of the quadratic polynomial $x^2-2\sqrt{2}x$ and verify the relationship between the zeroes and the coefficients.

306) Find the zeroes of the quadratic polynomial $5x^2 + 8x - 4$ and verify the relationship between the zeroes and the coefficients of the polynomial.

307) If $\alpha$ and $\beta$ are the zeroes of a quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$ . Find the quadratic polynomial having $\alpha$ and $\beta$ as its zeroes. Verify the relationship between the zeroes and coefficients of the polynomial.

308) When $p(x) = x^2 + 7x + 9$ is divided by g(x), we get (x + 2) and - 1 as the quotient and remainder respectively, find g(x).

309) Find the zeroes of the following polynomials by factorisation method and verify the relationship between the zeroes and coefficients of the polynomials. Find all the zeroes of the polynomial $2x^4 + 7x^3-19x^2-14x+30$, if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

310) Find the zeroes of the following polynomials by factorisation method and verify the relationship between the zeroes and coefficients of the polynomials.Find others zeroes of $2x^4 - 9x^3 + 5x^2 + 3x - 1$, if two zeroes are $2+\sqrt{3}$ and $2-\sqrt{3}$.

311) Find the zeroes of the following polynomials by factorisation method and verify the relationship between the zeroes and coefficients of the polynomials.Obtain all the zeroes of $x^4-7x^3+17x^2-17x+6$, if two of its zeroes are 3 and 1.

312) Find the zeroes of the following polynomials by factorisation method and verify the relationship between the zeroes and coefficients of the polynomials $4x^2 + 5\sqrt{2}x - 3$

313) Find the zeroes of the following polynomials by factorisation method and verify the relationship between the zeroes and coefficients of the polynomials $2s^2 - (1+2\sqrt{2})s + \sqrt{2}$

314) Find the zeroes of the following polynomials by factorisation method and verify the relationship between the zeroes and coefficients of the polynomials $v^2+4\sqrt{3}v-15$

315) Utility poles were installed at every $(x^2 - x + 1)$m along a stretch of railboard track $(x^4 + 2x^3 - 4x^2 + 5x - 2)$m long. How many poles were used?

316) The central and state government of India allotted relief fund to help the families whose suffered from Corona virus. Both governments define the fund in the form of an expression $p(x) = 6x^3 + 11x^2 - 3x - 2$, where x is a contribution amount by the state government. Some part of this fund spend on their medicine Rs (3x + 1) and treatment Rs(x + 2).
(i) Find the rest of the amount, which is used for their children education.
(ii) If state government contribute the fund of 1 million, how much amount contribute by the central government?
(iii) Suppose state government released the tund of 50 lakh and central government also contribute some amounts, how much amount spend in medicine, treatment and children education?

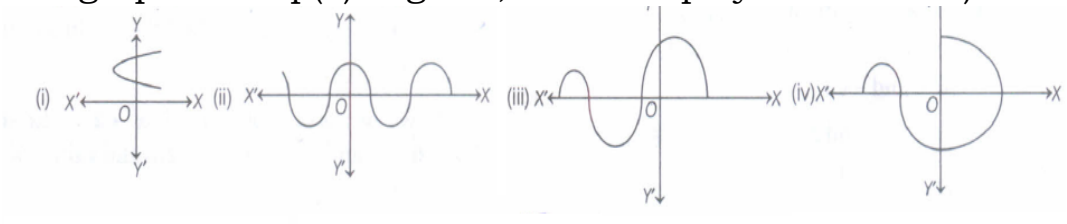
317) If (x + a) is a factor of two polynomials $x^2 + px + q$ and $x^2 + mx + n$, then prove that $a = \frac{n-q}{m-p}$

318) If $\alpha$ *and* $\beta$ are the zeroes of the quadratic polynomial $f(x) = x^2 -3x -2$, find a polynomial whose zeroes are $\frac{2\alpha}{\beta}$ *and* $\frac{2\beta}{\alpha}$

319) If a remainder on division of $x^3 + 2x^2+ kx + 3$ by x - 3 is 21, find the quotient and the value of k. Hence, find the zeroes of the cubic polynomial $x^3 + 2x^2- +kx-18$.

320) Find the zeroes of the polynomial $f(x) = x^3- 5x^2 - 2x +24$, if it is given that the product of its two zeroes is 12.

321) The graph of Y= p(x) is given, for some polynomials rftx). Find the number of zeroes of p (x) in each case




322) Divide $2x^2 + 3x + 1$ by x + 2.

323) Divide the polynomial p(x) by the polynomial g(x) and find the quotient and remainder in following :
$p(x) = x^3 - 3x^2 + 5x - 3$, $g(x) = x^2 - 2$

324) Divide the polynomial p(x) by the polynomial g(x) and find the quotient and remainder in of the following :
$p(x) = x^4 - 3x^2 + 4x + 5$, $g(x) = x^2 + 1 - x$

325) Divide the polynomial p(x) by the polynomial g(x) and find the quotient and remainder in following :
$p(x) = x^4 - 5x + 6$, $g(x) = 2 - x^2$

326) Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial
$t^2 - 3$, $2t^4 + 3t^3 - 2t^2 - 9t - 12$

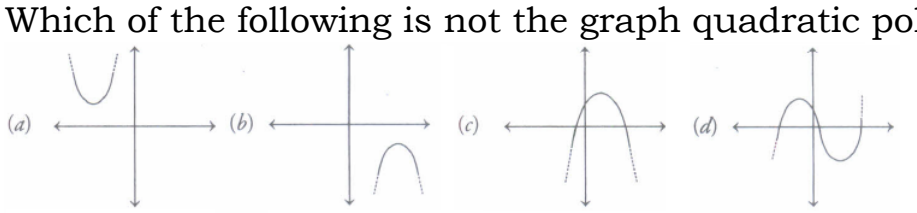
327) Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial
$x^2 + 3x + 1$, $3x^4 + 5x^3 - 7x^2 + 2x + 2$

328) Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial
$x^3 - 3x + 1$, $x^5 - 4x^3 + x^2 + 3x + 1$

329) Give example of polynomials p (x), g(x), q (x and r (x) , which satisfy the division algorithm and deg q(x) = deg r(x)

330) Give example of polynomial p (x), g(x), q (x and r (x) , which satisfy the division algorithm and deg r(x) = 0

331) Which of the following is not the graph quadratic polynomal?




332) If $\alpha$ *and* $\beta$ are the zeroes of the quadratic polynomial $f(x) = x^2 - 3x - 2$, find a polynomial whose zeroes are $(2\alpha + 3\beta)$ and $(3\alpha + 2\beta)$

333) If $\alpha$ *and* $\beta$ are the zeroes of the quadratic polynomial $f(x) = x^2 - 3x - 2$, find a polynomial whose zeroes are
$\frac{2\alpha}{\beta}$ and $\frac{2\beta}{\alpha}$

334) If $\alpha$ *and* $\beta$ are the zeroes of the quadratic polynomial $f(x) = x^2 - 3x - 2$, find a polynomial whose zeroes are
$\frac{1}{2\alpha+\beta}$ and $\frac{1}{2\beta+\alpha}$

335) We divide $x^3 - 2x + 3$ by $x + 3$ and verify the division algorithm.

336) Apply division algorithm to check if $g(x) = x^2 - 3x + 2$ is a factor of the polynomial $f(x) = x^4 - 2x^3 - x + 2$.

337) Find all zeroes of the polynomial $3x^3 + 10x^2 - 9x - 4$ if one of its zero is 1

338) Find all the zeroes of the polynomial $x^4 + x^3 - 14x^2 - 2x + 24$, if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$ .

339) Find all zeroes of the polynomial $2x^4 - 9x^3 + 5x^2 + 3x - 1$),if two of its zeroes are
$(2 + \sqrt{3})$ and $(2 - \sqrt{3})$ .

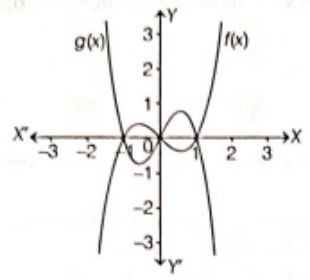
340) Find the zeroes of the following polynomial by factorisation method and verify the relations between the zeroes and their coefficients. $7y^2 - \frac{11}{3}y - \frac{2}{3}$

341) Find the zeroes of the following polynomial by factorisation method and verify the relations between the zeroes and their coefficients $-\sqrt{3}, -7/\sqrt{3}$

342) Find the zeroes of the following polynomial by factorisation method and verify the relations between the zeroes and their coefficients $\frac{-2}{\sqrt{3}}, \frac{3}{4\sqrt{3}/2}$

343) If one zero of the polynomial $x^2 - 8x + k$ exceeds the other by 2, then find the zeroes and value of k.

344) Shown below are the graphs of two cubic polynomial, f(x) and g(x), Both polynomials have the zeroes - 1, 0 and 1.




Anya said, "Both the graphs represent the same polynomial, f(x) = g(x) = (x + 1)(x + 0)(x - 1) as they have the same zeroes."
Pranit said, "Both the graphs represent two different polynomials, f(x) = (x + 1)(x + 0)(x - 1) and g(x)= - (x + 1) (x + 0)(x - 1) and only two such polynomials exist that can have the zeroes (-1), 0 and 1."
Aadar said, "Both the graphs represents two different polynomials and infinitely many such polynomials exist that have the zeroes - 1,0 and 1.' Who is right? Justify your answer.

345) $p(x) = ax^2 - 8x + 3$ where a is a non-zero real number. One zero of p(x) is 3 times the other zero.
(i) Find the value of a. Show your work.
(ii) What is the shape of the graph of p(x) ? Give a reason for your answer.

346) A polynomial is given by $q(x) = x^3 - 2x^2 - 9x + k$ where k is a constant.The sum of two zeroes of g (x) is zero. Using the relationship between the zeroes and coefficients of a polynomial, find the
(i) zeroes of q(x).
(ii) value of k.
Show your steps

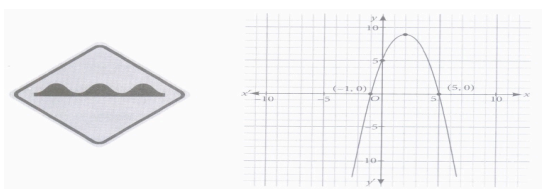
347) A class consists of a group of 18 average students and 7 best students of the class. Write a quadratic polynomials whose zeroes are equal to number of average students and number of best students.

348) If the sum of the zeroes of the polynomial $p(x) = (a+1)x^2 + (2a + 3)x +(3a + 4)$ is -1, then find the product of its zeroes.

349) Find the zeroes of the quadratic polynomial $x^2 - 15$ and verify the relationship between the zeroes and the coefficients of the polynomial.

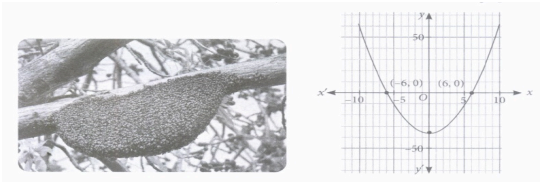
Case Study Questions 24 x 4 = 96

350) ABC construction company got the contract of making speed humps on roads. Speed humps are parabolic in shape and prevents overspeeding, mini mise accidents and gives a chance for pedestrians to cross the road. The mathematical representation of a speed hump is shown in the given graph.




Based on the above information, answer the following questions.
(i) The polynomial represented by the graph can be _____polynomial.
**(a) Linear (b) Quadratic**
**(c) Cubic (d) Zero**
(ii) The zeroes of the polynomial represented by the graph are
**(a) 1,5 (b) 1,-5**
**(c) -1,5 (d) -1,-5**
(iii) The sum of zeroes of the polynomial represented by the graph are
**(a) 4 (b) 5 (c) 6 (d) 7**
(iv) If a and β are the zeroes of the polynomial represented by the graph such that $\beta > \alpha,$ then $|8\alpha + \beta| =$
**(a) 1 (b) 2 (c) 3 (d) 4**
(v) The expression of the polynomial represented by the graph is
$(a)\ -x^2 - 4x - 5 \quad (b)x^2 + 4x + 5 \quad (c)x^2 + 4x - 5 \quad (d) - x^2 + 4x + 5$

351) While playing in garden, Sahiba saw a honeycomb and asked her mother what is that. She 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 parabolic. The mathematical representation of the honeycomb structure is shown in the graph.




Based on the above information, answer the following questions.

(i) Graph of a quadratic polynomial is in_____shape.

**(a) straight line (b) parabolic**

**(c) circular (d) None of these**

(ii) The expression of the polynomial represented by the graph is

**(a) $x^2$-49 (b) $x^2$-64 (c) $x^2$-36 (d) $x^2$-81**

(iii) Find the value of the polynomial represented by the graph when x = 6.

**(a) -2 (b) -1 (c) 0 (d) 1**

(iv) The sum of zeroes of the polynomial $x^2 + 2x - 3$ is

**(a) -1 (b) -2 (c) 2 (d) 1**

(v) If the sum of zeroes of polynomial $at^2 + 5t + 3a$ is equal to their product, then find the value of a.

**(a) -5 (b) -3** (c) $\frac{5}{3}$ (d) $\frac{-5}{3}$

352) Just before the morning assembly a teacher of kindergarten school observes some clouds in the sky and so she cancels the assembly. She also observes that the clouds has a shape of the polynomial. The mathematical representation of a cloud is shown in the figure.


(i) Find the zeroes of the polynomial represented by the graph.

**(a) -1/2,7/2 (b) 1/2, -7/2 (c) -1/2, -7/2 (d) 1/2,7/2**

(ii) What will be the expression for the polynomial represented by the graph?

$(a)p(x) = 12x^2 - 4x - 7$ $(b)p(x) = -x^2 - 12x + 3$ $(c)p(x) = 4x^2 + 12x + 7$ $(d)p(x) = -4x^2$

(iii) What will be the value of polynomial represented by the graph, when x = 3?

**(a) 65 (b) -65 (c) 68 (d) -68**

(iv) If a and $\beta$ are the zeroes of the polynomial $f(x) = x^2 + 2x - 8$ , then $\alpha^4 + \beta^4 =$

**(a) 262 (b) 252 (c) 272 (d) 282**

(v) Find a quadratic polynomial where sum and product of its zeroes are $0, \sqrt{(7)}$ respectively.

$(a)k\left(x^2 + \sqrt{7}\right)$ $(b)k\left(x^2 - \sqrt{7}\right)$ $(c)k\left(x^2 + \sqrt{5}\right)$ **(d) none of these**

353) Pankaj's father gave him some money to buy avocado from the market at the rate of $p(x) = x^2 - 24x + 128$. Let a , $\beta$ are the zeroes of p(x).

Based on the above information, answer the following questions.

(i) Find the value of a and $\beta$, where a < $\beta$.

**(a) -8, -16** **(b) 8,16** **(c) 8,15** **(d) 4,9**

(ii) Find the value of $\alpha + \beta + \alpha\beta$.

**(a) 151** **(b) 158** **(c) 152** **(d) 155**

(iii) The value of p(2) is

**(a) 80** **(b) 81** **(c) 83** **(d) 84**

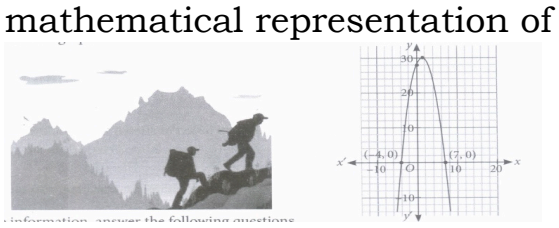
(iv) If $\alpha$ and $\beta$ are zeroes of $x^2 + x - 2$, then $\frac{1}{\alpha} + \frac{1}{\beta} =$

**(a) 1/2** **(b) 1/3** **(c) 1/4** **(d) 1/5**

(v) If sum of zeroes of $q(x) = kx^2 + 2x + 3k$ is equal to their product, then k =

**(a) 2/3** **(b) 1/3** **(c) -2/3** **(d) -1/3**

354) Two friends Trisha and Rohan during their summer vacations went to Manali. They decided to go for trekking. While trekking they observes that the trekking path is in the shape of a parabola. The mathematical representation of the track is shown in the graph.




Based on the above information, answer the following questions.

(i) The zeroes of the polynomial whose graph is given, are

**(a) 4,7** **(b) -4,7** **(c) 4,3** **(d) 7,10**

(ii) What will be the expression of the given polynomial p(x)?

$(a) x^2 - 3x + 38$ $(b) -x^2 + 4x + 28$ $(c) x^2 - 4x + 28$ $(d) -x^2 + 3x + 28$

(iii) Product of zeroes of the given polynomial is

**(a) -28** **(b) 28** **(c) -30** **(d) 30**

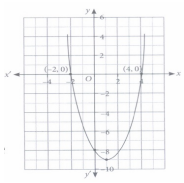
(iv) The zeroes of the polynomial $9x^2 - 5$ are

$(a) \frac{3}{\sqrt{5}}, \frac{-3}{\sqrt{5}}$ $(b) \frac{2}{\sqrt{5}}, \frac{-2}{\sqrt{5}}$ $(c) \frac{\sqrt{5}}{3}, \frac{-\sqrt{5}}{3}$ $(d) \frac{\sqrt{5}}{2}, \frac{-\sqrt{5}}{2}$

(v) If $f(x) = x^2 - 13x + 1$, then f(4) =

**(a) 35** **(b) -35** **(c) 36** **(d) -36**

355) Neeru saw a creeper on the boundary of her aunt's house which was in the shape as shown in the figure. Answer the following questions by considering that creeper has same mathematical shape as shown in the figure. Based on the above information, answer the following questions.




(i) The shape represents a _____ polynomial.

**(a) Linear** **(b) Cubic**

**(c) Quadratic** **(d) None of these**

(ii) How many zeroes does the polynomial (shape of the creeper) have?

**(a) 0** **(b) 1** **(c) 2** **(d) 3**

(iii) The zeroes of the polynomial, represented by the graph, are

**(a) 4, -2** **(b) -4,2** **(c) 4,2** **(d) -5,6**

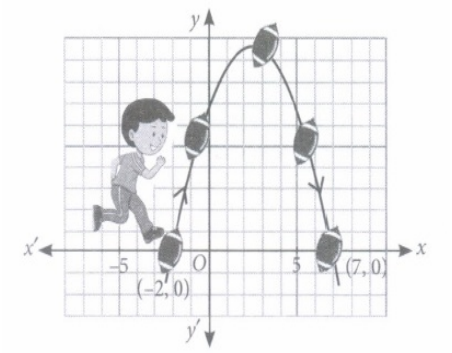
(iv) The expression of the polynomial, represented by the graph, is

$(a) x^2 + 2x - 8$ $(b) x^2 - 2x - 8$ $(c) x^3 - x + 8$ $(d) x^3 - x^2 + 2x + 8$

(v) For what value of x, the value of the polynomial, represented by the graph, is -5?

**(a) x=3** **(b) x=-1** **(c) Both (a) and (b)** **(d) Can't be determined**

356) In a soccer match, the path of the soccer ball in a kick is recorded as shown in the following graph.




Based on the above i!;formation, answer the following questions.

(i) The shape of path of the soccer ball is a

**(a) Circle** **(b) Parabola** **(c) Line** **(d) None of these**

(ii) The axis of symmetry of the given parabola is

**(a) y-axis** **(b) x-axis**

**(c) line parallel to y-axis** **(d) line parallel to x-axis**

(iii) The zeroes of the polynomial, represented in the given graph, are

**(a) -1,7** **(b) 5,-2** **(c) -2,7** **(d) -3,8**

(iv) Which of the following polynomial has -2 and -3 as its zeroes?

$(a)x^2 - 5x - 5$ $(b)x^2 + 5x - 6$ $(c)x^2 + 6x - 5$ $(d)x^2 + 5x + 6$

(v) For what value of 'x', the value of the polynomial $f(x) = (x - 3)^2 + 9$ is 9?

**(a) 1** **(b) 2** **(c) 3** **(d) 4**

357) Prachi was playing with a slinky spring dog toy and asked her brother Rhythm, what is the shape thus formed called. Rhythm explained her that the shape formed is a parabola. He also explained her that parabola is the graphical representation of a quadratic polynomial.

Based on the above information, answer the following questions.

(i) The general form of polynomial representing the parabolic graph is

$(a)ax^2 + c, a \neq 0$ $(b)ax^2 + bx + c, b \neq 0$

$(c)ax^2 + bx + c, a, bandc \neq 0$ $(d)ax^2 + bx + c, a \neq 0$

(ii) Kavita drawn a parabola passing through (-4, 3), (-1,0), (1, 8), (0, 3), (-3,0) and (-2, -1) on the graph paper. Then zeroes of the polynomial representing the graph is

**(a) 3 and-3** **(b) -1and -2** **(c) -3 and-1** **(d) 1and 8**

(iii) Which of the following is correct?

**(a) A parabola intersects x-axis at maximum 2 points.**

**(b) A parabola intersects x-axis only at 1 point.**

**(c) A parabola intersects x-axis exactly at 2 points.**

**(d) A parabola intersects x-axis at least at 2 points.**

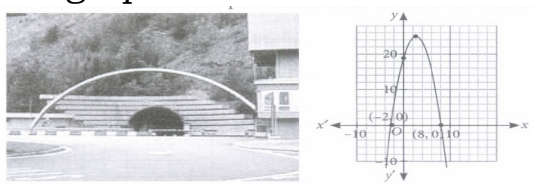
(iv) The product of roots of the polynomial 5x(x - 6) is

**(a) 3/2 (b) 2/3 (c) 3 (d) 0**

(v) The sum of zeroes of a quadratic polynomial $ax^2 + bx + c, a \neq 0$ is

**(a) a/b (b) a/c (c) -b/a (d) -c/a**

358) Shweta and her husband Sunil who 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.




Based on the above information, answer the following questions.

(i) The zeroes of the polynomial whose graph is given, are

**(a) -2,8** **(b) -2, -8** **(c) 2,8** **(d) -2, 0**

(ii) What will be the expression of the polynomial given in diagram?

$(a)x^2 - 6x + 16$ $(b) - x^2 + 6x + 16$ $(c)x^2 + 6x + 16$ $(d) - x^2 - 6x - 16$

(iii) What is the value of the polynomial, represented by the graph, when x = 4?

**(a) 22 (b) 23 (c) 24 (d) 25**

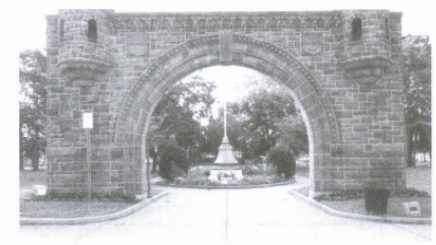
(iv) If the tunnel is represented by $x^2 + 3x - 2$, then its zeroes are

**(a) -1, -2 (b) 1, -2 (c) -1,2 (d) 1,2**

(v) If one zero is 4 and sum of zeroes is -3, then representation of tunnel as a polynomial is

$(a)x^2 - x + 24$ $(b) - x^2 - 3x + 28$ $(c)x^2 + x + 28$ $(d)x^2 - x + 28$

359) Quadratic polynomial can be used to model the shape of many architectural structures in the world. Pershing field of Jersey city in US is one such structure. Based on the above information, answer the following questions.



(i) If the Arch is represented by $10x^2 - x - 3$ then its zeroes are

$(a)\frac{1}{2}, \frac{-3}{2}$ $(b)\frac{-1}{2}, \frac{3}{5}$ $(c)\frac{-1}{2}, \frac{1}{3}$ $(d)\frac{-1}{3}, \frac{2}{3}$

(ii) The zeroes of the polynomial are the points where its graph

**(a) intersect the x-axis** **(b) intersect the y-axis**

**(c) intersect either of the axes** **(d) Can't say**

(iii) The quadratic polynomial whose sum of zeroes is 0 and product of zeroes is 1 is given by

$(a)x^2 - x$ $(b)x^2 + x$ $(c)x^2 - 1$ $(d)x^2 + 1$

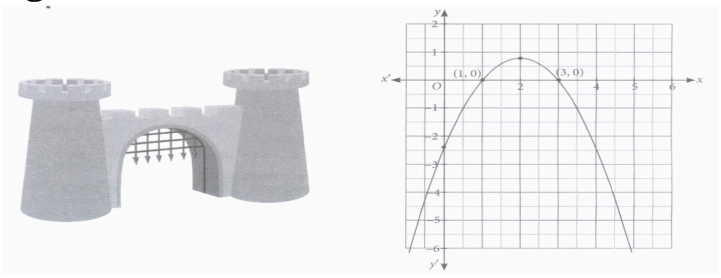
(iv) Which of the following has $\frac{-1}{2}$ and 2 as their zeroes?

$(a)6x^2 - 4x + 6$ $(b)3x^2 - x + 2$ $(c)2x^2 - 7x + 2$ $(d)2x^2 - 3x - 2$

(v) The product of zeroes of the polynomial $\sqrt{3}x^2 - 14x + 8\sqrt{3}$ is

**(a) 4 (b) 6 (c) 8 (d) 10**

360) Priya visited a temple in Gwalior. On the way she sees the Agra Fort. The entrance gate of the fort has a shape of quadratic.polynomial (parabolic). The mathematical representation of the gate is shown in the figure .




Based on the above information, answer the following questions.

(i) Find the zeroes of the polynomial represented by the graph.

**(a) -1,3 (b) 1,3 (c) 1,-3 (d) 0,1**

(ii) What will be the expression for the polynomial represented by the graph?

$(a)x^2 + 4x - 5 \quad (b)x^2 - 4x + 5 \quad (c) - x^2 + 4x - 3 \quad (d)x^2 + 5x - 4$

(iii) What will be the value of polynomial, represented by the graph, when x = 4?

**(a) -2 (b) 3 (c) -3 (d) 2**

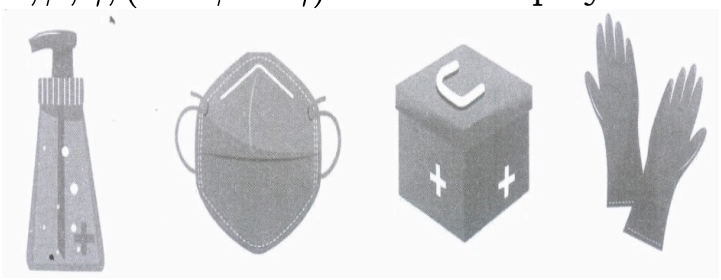
(iv) If one zero of a polynomial p(x) is 7 and product of its zeroes is -35, then p(x) =

$(a) - x^2 + 2x + 35 \quad (b)x^2 + 2x + 35 \quad (c)x^2 + 12x - 35 \quad (d)x^2 - 12x - 35$

(v) If the gate is represented by the polynomial $-x^2 + 5x - 6$ then its zeroes are

**(a) 2,-3 (b) 2,3 (c) -2,3 (d) -2,-3**

361) Shray, who is a social worker, wants to distribute masks, gloves, and hand sanitizer bottles in his block. Number of masks, gloves and sanitizer bottles distributed in 1 day can be represented by the zeroes $\alpha, \beta, \gamma, (\alpha > \beta > \gamma)$ of the polynomial $p(x) = x^3 - 18x^2 + 95x - 150$.



Based on the above information, answer the following questions.

(i) Find the value of $\alpha, \beta, \gamma$.

**(a) -10, -5,-3 (b) 3,6,5**

**(c) 10,5,3 (d) 4,8,9**

(ii) The sum of product of zeroes taken two at a time is

**(a) 91 (b) 92 (c) 94 (d) 95**

(iii) Product of zeroes of polynomial p(x) is

**(a) 150 (b) 160 (c) 170 (d) 180**

(iv) The value of the polynomial p(x), when x = 4 is

**(a) 5 (b) 6 (c) 7 (d) 8**

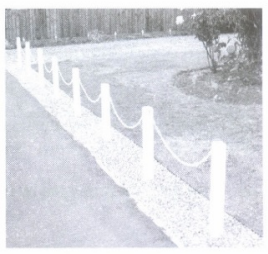
(v) If $\alpha, \beta, \gamma$ are the zeroes of a polynomial g(x) such that

$\alpha + \beta + \gamma = 3, \alpha\beta + \beta\gamma + \gamma\alpha = -16$ and $\alpha\beta\gamma = -48$ then, g(x) =

$(a)x^3 - 2x^2 - 48x + 6 \quad (b)x^3 + 3x^2 + +16x - 48$

$(c)x^3 - 48x^2 - 16x + 3 \quad (d)x^3 - 3x^2 - 16x + 48$

362) While playing badminton Ronit seeing the barrier chains hung between two posts at the edge of the walk way of a street. It is hung in the shape of the parabola. Parabola is the graphical representation of a particular type of polynomial. Based on the above information, answer the following questions.



(i) Which of the following polynomial is graphically represented by a parabola?

**(a) Linear polynomial** **(b) Quadratic polynomial**

**(c) Cubic polynomial** **(d) None of these**

(ii) If a polynomial, represented by a parabola, intersects the x-axis at -3, 4 and y-axis at -2, then its zero(es) is/are

**(a) -1,2and-2 (b) 2 and-2 (c) -1 (d) -3 and 4**

(iii) If the barrier chains between two posts is represented by the polynomial $x^2 - x - 12$ then its zeroes are

**(a) 4,3 (b) -2,5 (c) 4, -3 (d) 4,-5**

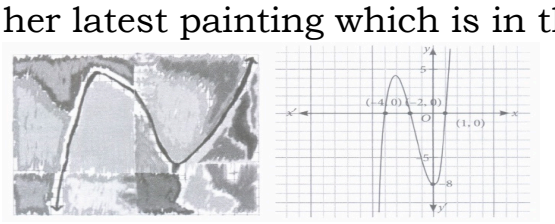
(iv) The sum of zeroes of the polynomial $4x^2 - 9x + 2$ is

**(a) 1/4 (b) 9/4 (c) 2/4 (d) -9/4**

(v) The reciprocal of product of zeroes of the polynomial $x^2 - 9x + 20$ is

**(a) 5 (b) 1/8 (c) 1/20 (d) 20**

363) Shruti is very good in painting. So she thought of exhibiting her paintings in which she want to display her latest painting which is in the form of a graph of a polynomial as shown below:




Based on the above information, answer the following questions.

(i) The number of zeroes of the polynomial represented by the graph is

**(a) 1 (b) 2 (c) 3 (d) can't be determined**

(ii) The sum of zeroes of the polynomial represented by the graph is

**(a) -4 (b) -3 (c) 2 (d) -5**

(iii) Find the value of the polynomial represented by the graph when x = 0.

**(a) -6 (b) -8 (c) 6 (d) 8**

(iv) The polynomial representing the graph drawn in the painting by Shruti is a

**(a) quadratic polynomial** **(b) cubic polynomial**

**(c) bi-quadratic polynomial** **(d) linear polynomial**

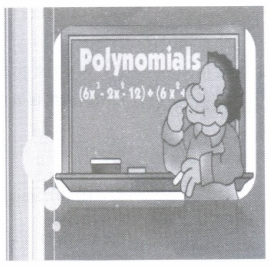
(v) The sum of product of zeroes, taken two at a time, of the polynomial represented by the graph is

**(a) 2 (b) 3 (c) -2 (d) -3**

364) The tutor in a coaching centre was explaining the concept of cubic polynomial as - A cubic polynomial is of the form $ax^3 + bx^2 + cx + d, a \neq 0$ and it has maximum three real zeroes. The zeroes of a cubic polynomial are namely the x-coordinates of the points where the graph of the polynomial intersects the x-axis. If $\alpha$ , $\beta$ and $\gamma$ are the zeroes of a cubic polynomial $ax^3 + bx^2 + cx + d$ then the relation between their zeroes and their coefficients are $\alpha + \beta + \gamma = -b/a$

$\alpha\beta + \beta\gamma + \alpha\gamma = c/a$

$\alpha\beta\gamma = -d/a$




Based on-the above information, answer the following questions.

(i) Which of the following are the zeroes of the polynomial $x^3 - 4x^2 - 7x + 10$?

**(a) -3,1 and 3** **(b) -1,2 and-3**

**(c) 2, -1 and 5** **(d) -2,1 and 5**

(ii) If $-\frac{1}{2}$ -2 and 5 are zeroes of a cubic polynomial, then the sum of product of zeroes taken two at a time is

$(a)\frac{23}{2}$ $(b) -\frac{1}{2}$

$(c) -23$ $(d) -\frac{23}{2}$

(iii) In which of the following polynomials the sum and product of zeroes are equal?

$(a)x^3 - x^2 + 5x - 1$ $(b)x^3 - 4x$

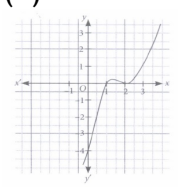
$(c)3x^3 - 5x^2 - 11x - 3$ **(d) Both (a) and (b)**

(iv) The polynomial whose all the zeroes are same is

$(a)x^3 + x^2 + x - 1$ $(b)x^3 - 3x^2 + 3x - 1$

$(c)x^3 - 5x^2 + 6x - 1$ $(d)3x^3 + x^2 + 2x - 1$

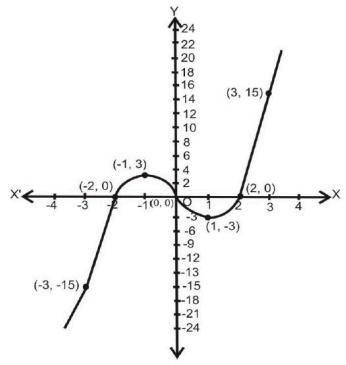
(v) The cubic polynomial, whose graph is as shown below, is



$(a)x^3 - 5x^2 + 8x - 4$ $(b)x^3 - 7x^2 + 11x + 9$

$(c)3x^3 - 4x^2 + x - 5$ $(d)x^3 - 9$

365) One day, due to heavy storm an electric wire got bent as shown in the figure. It followed some mathematical shape of curve. Answer the following questions below.




(i) How many zeroes are there for the polynomial (shape of the wire)

**(a) 2** **(b) 3** **(c) 4** **(d) 5**

(b) Find the zeroes of the polynomial.

**(a) 2, 0, -2** **(b) 2, -2, -5** **(c) -2, 2, -5.5** **(d) None of these**

366) Junk food is unhealthful food that is high in calories from sugar or fat, with little dietary fiber, protein, vitamins, minerals, or other important forms of nutritional value. A sample of few students have taken. If α be the number of students who take junk food, β be the number of students who take healthy food such that $\alpha > \beta$ and $\alpha$ and $\beta$ are the zeroes of the quadratic polynomial $f(x) = x^2 - 7x + 10$, then answer the following questions:


(i) Name the type of expression of the polynomial in the above statement?

**(a) quadratic (b) cubic (c) linear (d) bi-quadratic**

(ii) Find the number of students who take junk food.

**(a) 5 (b) 2 (c) 7 (d) None of these**

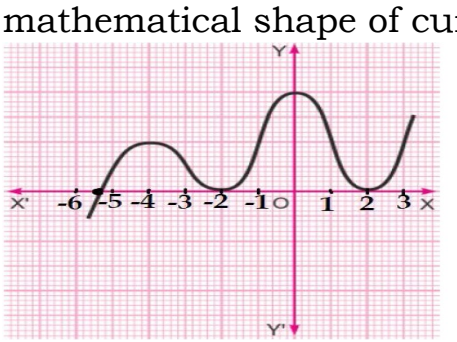
(iii) Find the quadratic polynomial whose zeros are -3 and -4.

**(a) $x^2 + 4x + 2$ (b) $x^2 - x - 12$ (c) $x^2 - 7x + 12$ (d) None of these**

(iv) If one zero of the polynomial $x^2 - 5x + 6$ is 2 then find the other zero.

**(a) 6 (b) -6 (c) 2 (d) None of these**

367) One day, due to heavy strom an electric wire got brnt as shown in the figure. It followed some mathematical shape of curve. Answer the following questions below.




(i) How many zeroes are there for the polynomial (shape of the wire)

**(a) 2 (b) 3 (c) 4 (d) 5**

(ii) Find the zeroes of the polynomial.

**(a) 2, 0, -2 (b) 2, -2, -5 (c) -2, 2, -5.5 (d) None of these**

(iii) Find the quadratic polynomial whose zeros are 3 and -4.

**(a) $x^2 + 4x + 2$ (b) $x^2 + x - 12$ (c) $x^2 - 7x - 12$ (d) None of these**

(iv) If one zero of the polynomial $x^2 - 2x - 3$ is -4, then find the other zero.

**(a) 6 (b) -6 (c) 2 (d) -2**

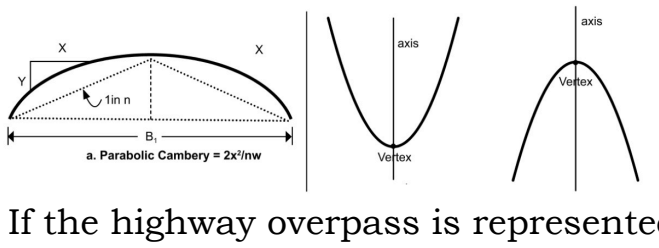
368) Applications of Parabolas-Highway Overpasses/Underpasses A highway underpass is parabolic in shape.

Parabola

A parabola is the graph that results from $p(x) = ax^2 + bx + c$ Parabolas are symmetric about a vertical line known as the Axis of Symmetry.

The Axis of Symmetry runs through the maximum or minimum point of the parabola which is called the vertex.

Shape of the cross slope




(i) If the highway overpass is represented by $x^2$ - 2x -8.then its zero are

**(a) (2,-4) (b) (4,-2) (c) (-2,-2) (d) (-4,-4)**

(ii) The highway overpass is represented graphically. Zeroes of a polynomial can be expressed graphically. Number of zeroes of polynomial is equal to number of points where the graph of polynomial

**(a) Intersects x-axis (b) Intersects y-axis (c) Intersects y-axis or x-axis (d) None of the above**

(iii) Graph of a quadratic polynomial is a

**(a) straight line (b) circle (c) parabola (d) ellipse**

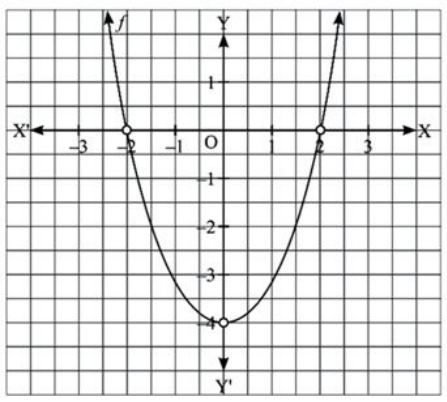
(iv) The representation of Highway Underpass whose one zero is 6 and sum of the zeroes is 0, is

**(a) $x^2 - 6x + 2$ (b) $x^2 - 36$ (c) $x^2 - 6$ (d) $x^2 - 3$**

(v) The number of zeroes that polynomial f(x) = (x – 2)2 + 4 can have is:

**(a) 1 (b) 2 (c) 0 (d) 3**

369) Puja tied a rope between two poles for drying clothes in her garden. She was very happy that the rope is working fine but One day due to heavy storm the rope bent as shown in the below figure. The bent shape followed a mathematical shape.




(i) How many zeroes are there for the polynomial (shape of the wire)

**(a) 2 (b) 3 (c) 1 (d) 0**

(ii) The zeroes of the polynomial are :

**(a) 2 (b) 3 (c) 1 (d) 0**

(iii) Name the shape in which the wire is bent.

**(a) spiral (b) elipse (c) linear (d) parabola**

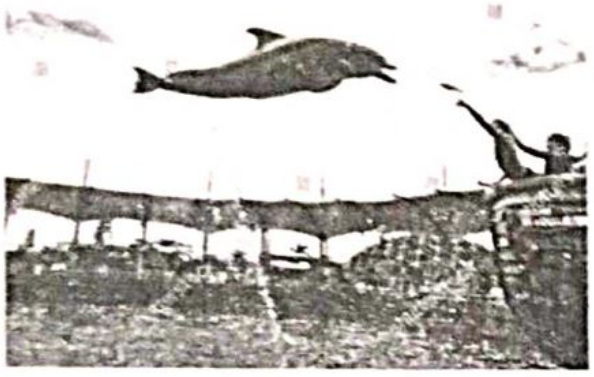
(iv) What will be the expression of the polynomial?

**(a) x2+4 (b) x2-4 (c) x+4 (d) (x-2)**

(v) What is the value of the polynomial if x=-2 ?

**(a) 2 (b) -4 (c) 0 (d) 9**

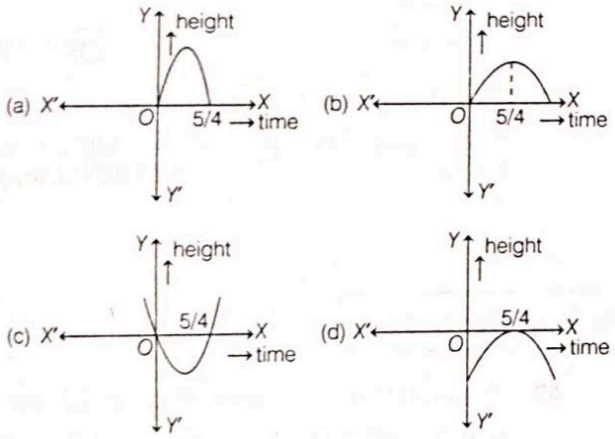
370) In a pool at an aquarium, a dolphin jumps out of the water travelling at 20 cm/s. Its height above water level after t s is given by $h = 20t - 16t^2$.



On the basis of above information, answer the following questions.

(i) Find zeroes of polynomial $p(t) = 20t - 16t^2$.

(ii) Which of the following types of graph represents p(t)?



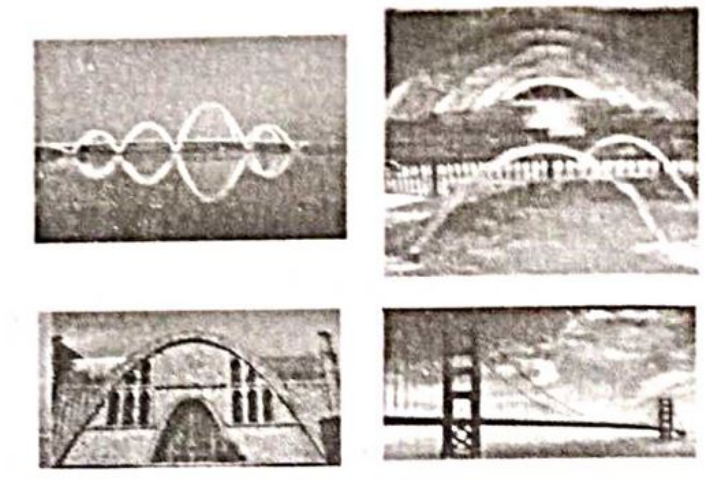

(iii) (a) What would be the value of h at $t = \frac{3}{2}$ ?

Interpret the result.

Or

(b) How much distance has the dolphin covered before hitting the water level again?

371) 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.



On the basis of above information, answer the following questions.
(i) In the standard form of quadratic polynomial, $ax^2 + bx + c$, a, b and c are
(a) real numbers
(b) rational numbers.
(c) a is a non-zero real number, b and c are any real numbers.
(d) integers.
(ii) If the roots of the quadratic polynomial are equal, where the discriminant $D = b^2 - 4ac$, then
(a) $D > 0$ (b) $D < 0$ (c) $D \geq 0$ (d) $D = 0$
(iii) If $\alpha$ and $\frac{1}{\alpha}$ are the zeroes of the quadratic polynomial $2x^2 - x + 8k$, then k is
(a) 4 (b) $\frac{1}{4}$ (c) $\frac{-1}{4}$ (d) 2
(iv) The graph of $x^2 + 1 = 0$
(a) intersects X-axis at two distinct points.
(b) touches X-axis at a point.
(c) neither touches nor intersects X-axis.
(d) Either touches or intersects X-axis.
(v) If the sum of the roots is -p and product of the roots is $-\frac{1}{p}$ , then the quadratic polynomial is
$(a)k\left(-px^2 + \frac{x}{p} + 1\right)$
$(b)k\left(px^2 - \frac{x}{p} - 1\right)$
$(c)k\left(x^2 + px - \frac{1}{p}\right)$
$(d)k\left(x^2 - px + \frac{1}{p}\right)$

372) 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.

On the basis of above information, answer the following questions.
(i) The graph of a rainbow y = f(x) is shown in the figure. write the number of zeroes of the curve.
(ii) 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?
(iii) (a) 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. (or)
(b) The polynomial $x^2 - 2x - (7p + 3)$ represents a rainbow. If -4 is a zero of it, find the value of p.

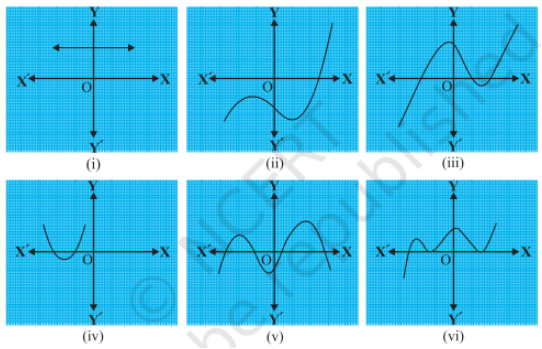
373) Teaching Mathematics through activities is a powerful approach that enhances students' understanding and engagement. Keeping this in mind, Ms. Mukta planned a prime number game for class 5 students. She announces the number 2 in her class and asked the first student to multiply it by a prime number and then pass it to second student. Second student also multiplied it by a prime number and passed it to third student. In this way by multiplying to a prime number, the last student go 173250.
Now, Mukta asked some questions as given below to the students
(a) What is the least prime number used by students ?
(b) (i) How many students are in the class?
(ii) What is the highest prime number used by students?
(c) Which prime number has been used maximum times?

5 Marks 70 x 5 = 350

374) Find a quadratic polynomial, the sum and product of whose zeroes are -3 and 2, respectively.

375) Find the zeroes of the polynomial $x^2$-3 and verify the relationship between the zeroes and the coefficients.

376) The graphs of y = p(x) are given below, for some polynomials p(x). Find the number of zeroes of p(x) in each case.




377) Verify that 3, –1, $-\frac{1}{3}$ are the zeroes of the cubic polynomial p(x) = $3x^3 – 5x^2 – 11x – 3$, and then verify the relationship between the zeroes and the coefficients.

378) Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients.
$x^2 – 2x – 8$

379) Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroe and the coefficients.
$4s^2 – 4s + 1$

380) Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroe and the coefficients.
$6x^2 – 3 – 7x$

381) Find the degree of the following polynomial
(i) $7y^5 + 6y^2 - 1$
(ii) $\frac{y^4+3y^2+y}{y}$

382) What is the geometrical meaning of the zeroes of a polynomial?

383) Find the zeroes of quadratic polynomial $y^2$+92y+1920.

384) If α and β are the zeroes of $4x^2$+3x+7, then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$ .

385) If the sum and difference of zeroes of quadratic polynomial are -3 and -10. respectively. Then, find the difference of the squares of zeroes.

386) If one of the zeroes of the cubic polynomial $x^3$+$ax^2$+bx+c is -1, then find the product of the other two zeroes.

387) Two zeroes of cubic polynomial $ax^3$+$3x^2$-bx-6 are -1 and -2. Find the third zero and values of a and b.

388) Find the quadratic polynomial, whose sum of zeroes is 8 and their products is 12. Then, find the zeroes of the polynomial.

389) Find the quadratic polynomial whose zeroes are $2\sqrt{7}$ and $-5\sqrt{7}$ .

390) Find the quadratic polynomial whose zeroes are 2 and -6, respectively. Verify the relation between the coefficients and zeroes of the polynomial.

391) If 1 and -1 are zeroes of polynomial $Lx^4+Mx^3+Nx^2+Rx+P$, then show that L+N+P=M+R.

392) How many polynomials will have their zeroes as -2 and 5?

393) If α and β are zeroes of the quadratic polynomial $p(x)=6x^2+x-1$, then find the value of
$\frac{\alpha}{\beta}+\frac{\alpha}{\alpha}+2\left(\frac{1}{\alpha}+\frac{1}{\beta}\right)+3\alpha\beta$

394) On dividing polynomial p(x) by 3x+1, the quotient is 2x-3 and the remainder is -2. Find p(x).

395) What will be the quotient and the remainder on division of $ax^2+bx+c$ by $px^3+qx^2+rx+5, p\neq 0$

396) Divide the polynomial $x^3-6x^2+11x-6$ by the polynomial $x^2+x+1$ and find the quotient and remainder.

397) Find the value of k, for which polynomial p(x) is exactly divisible by polynomial g(x), in each of the following
(i) $p(x)=x^3+8x^2+kx+18$, $g(x)=x^2+6x+9$
(ii) $p(x)=x^4+10x^3+25x^2+15x+k$, $g(x)=x+7$

398) Obtain all other zeroes of the polynomial $x^4+7x^3+7x^2-35x-60$, if two of its zeroes are -3 and -4.

399) If one zero of a polynomial $2x^2+x^2-7x-6$ is 2, then find all the zeroes.

400) 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, then find the values of a and b.

401) A polynomial g(x) of degree zero is added to the polynomial $2x^3+5x^2-14x+10$, so that it becomes exactly divisible by 2x-3. Find g(x).

402) If the polynomial $f(x)=3x^4-9x^3+x^2+15x+k$ is completely divisible by $3x^2-5$, then find the value of k and hence the other two zeroes of the polynomial.

403) Verify that the numbers given along side of the cubic polynomials below are their zeroes. Also, verify the relationship between the zeroes and the coefficients
$2x^3+x^2-5x+2; 1/2, 1, -2$

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

405) If the zeroes of the polynomial $ax^2+bx+b=0$ are in the ratio m:n, then find the value of $\sqrt{\frac{m}{n}}+\sqrt{\frac{n}{m}}$ .

406) If α and β are the zeroes of the quadratic polynomial $f(x)=px^2+qx+r$, then evaluate $\frac{1}{p\alpha+q}+\frac{1}{p\beta+q}$ .

407) If α and β are the zeroes of the quadratic polynomial $p(s)=3s^2-6s+4$, then find the value of
$\frac{a}{\beta}+\frac{\beta}{a}+2\left(\frac{1}{a}+\frac{1}{\beta}\right)+3a\beta$ .

408) If α and β are the zeroes of the quadratic polynomial $f(x)=x^2-px+q$, then prove that
$\frac{a^2}{\beta^2}+\frac{\beta^2}{a^2}=\frac{p^4}{q^2}-\frac{4p^2}{q}+2.$

409) Ajay, Ankit and Vijay respectively calculated the following polynomials with sum of the zeroes as 18 and product of the zeroes as 81.
$x^2-18x+81$, $x^2+18x-81$, $2x^2-9x-81$
They discussed their solutions among themselves and point out mistakes in the calculations.
(i) Whose calculation is correct?
(ii) What are the values depict here?

410) Find other zeroes of the polynomial $2x^4-3x^3-5x^2+9x-3$, if it is given that two of its zeroes are $-\sqrt{3}$ and $\sqrt{3}$ , respectively

411) If the polynomial $x^4+2x^3+8x^2+12x+18$ is divided by another polynomial $x^2+5$, the remainder comes out to be px+q, then find the values of p and q.

412) Find the zeroes of quadratic polynomial $5x^2-4-8x$ and verify the relationship between the zeroes and the coefficients of the polynomial.

413) If polynomial $6x^4+8x^3+17x^2+21x+7$ is divided by another polynomial $3x^2+4x+1$, then what will be the quotient and remainder?

414) Find all the zeroes of $2x^4-9x^3+5x^2+3x-1$, if two of its zeroes are $2+\sqrt{3}$ and $2-\sqrt{3}$ .

415) If the polynomial $6x^4+8x^3-5x^2+ax+b$ is exactly divisible by the polynomial $2x^2-5$, then find the values of a and b.

416) Draw the graph of the polynomial $-x^2+4x-4$ and find the zeroes of the polynomial.

417) Write the cubic polynomial, whose zeroes are $2-2\sqrt{5}, 2+2\sqrt{5}$ and $1$, respectively.

418) The expression $2x^3+bx^2-cx+d$ leaves the same remainder, when divided by x+1 or x-2 or 2x-1. Find b and c.

419) Government of Delhi alloted Relief Fund to help the families whose houses and shops were burned in a fire accident. The fund is represented by $6x^3-11x^2+15x-24$.
The fund is equally divided between each of the families of that accident. Each family receives an amount of Rs. 3x-7. After distribution, Rs.7x+11 amount is left. The District Magistrate decided to use this amount to develop the infrastructure of the area. Find the number of families which received relief fund from Government. What value has been depicted here?