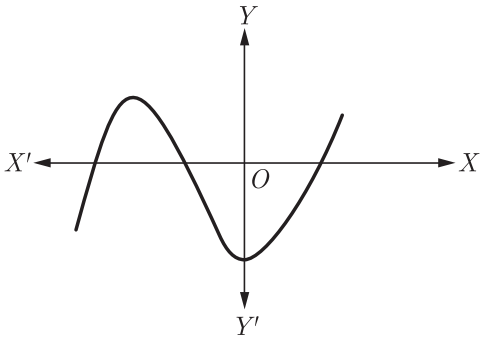
CHAPTER 2

POLYNOMIALS

1. If one zero of a quadratic polynomial (kx^2+3x+k) is 2, then the value of k is
(a) $\frac{5}{6}$
(b) $-\frac{5}{6}$
(c) $\frac{6}{5}$
(d) $-\frac{6}{5}$

Sol : www.cbse.site/ma/bm101

2. The graph of a polynomial is shown in Figure, then the number of its zeroes is



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

Sol : www.cbse.site/ma/bm102

3. The maximum number of zeroes a cubic polynomial can have, is
(a) 1
(b) 4
(c) 2
(d) 3

Sol : www.cbse.site/ma/bm103

4. If one zero of the quadratic polynomial x^2+3x+k is 2, then the value of k is
(a) 10
(b) -10
(c) -7
(d) -2

Sol : www.cbse.site/ma/bm104

5. 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) $-x^2+5x+6$

Sol : www.cbse.site/ma/bm105

6. If one zero of the polynomial $(3x^2+8x+k)$ is the reciprocal of the other, then value of k is
(a) 3
(b) -3
(c) $\frac{1}{3}$
(d) $-\frac{1}{3}$

Sol : www.cbse.site/ma/bm106

7. The zeroes of the polynomial $x^2-3x-m(m+3)$ are
(a) $m, m+3$
(b) $-m, m+3$
(c) $m, -(m+3)$
(d) $-m, -(m+3)$

Sol : www.cbse.site/ma/bm107

8. The value of x , for which the polynomials x^2-1 and x^2-2x+1 vanish simultaneously, is
(a) 2

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

Sol : www.cbse.site/ma/bm108

9. If α and β are zeroes and the quadratic polynomial $f(x) = x^2 - x - 4$, then the value of $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$ is
(a) $\frac{15}{4}$
(b) $-\frac{15}{4}$
(c) 4
(d) 15

Sol : www.cbse.site/ma/bm109

10. The value of the polynomial $x^8 - x^5 + x^2 - x + 1$ is
(a) positive for all the real numbers
(b) negative for all the real numbers
(c) 0
(d) depends on value of x

Sol : www.cbse.site/ma/bm110

11. Lowest value of $x^2 + 4x + 2$ is
(a) 0
(b) -2
(c) 2
(d) 4

Sol : www.cbse.site/ma/bm111

12. If the sum of the zeroes of the polynomial $f(x) = 2x^3 - 3kx^2 + 4x - 5$ is 6, then the value of k is
(a) 2
(b) -2
(c) 4
(d) -4

Sol : www.cbse.site/ma/bm112

13. 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

Sol : www.cbse.site/ma/bm113

14. 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) $-\frac{2}{3}$

Sol : www.cbse.site/ma/bm114

15. 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) $2x^2 + 2x - 24$

Sol : www.cbse.site/ma/bm115

16. If the zeroes of the quadratic polynomial $x^2 + (a+1)x + b$ are 2 and -3, then
(a) $a = -7, b = -1$
(b) $a = 5, b = -1$
(c) $a = 2, b = -6$
(d) $a = 0, b = -6$

Sol : www.cbse.site/ma/bm116

17. The zeroes of the quadratic polynomial $x^2 + 99x + 127$ are
(a) both positive
(b) both negative
(c) one positive and one negative
(d) both equal

Sol : www.cbse.site/ma/bm117

18. The zeroes of the quadratic polynomial x^2+kx+k where $k \neq 0$,
(a) cannot both be positive
(b) cannot both be negative
(c) are always unequal
(d) are always equal

Sol : www.cbse.site/ma/bm118

19. If the zeroes of the quadratic polynomial ax^2+bx+c, where $c \neq 0$, are equal, then
(a) c and a have opposite signs
(b) c and b have opposite signs
(c) c and a have same sign
(d) c and b have the same sign

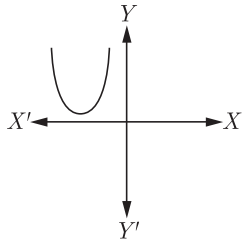
Sol : www.cbse.site/ma/bm119

20. 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) has no linear term and the constant term is positive.
(c) can have a linear term but the constant term is negative.
(d) can have a linear term but the constant term is positive.

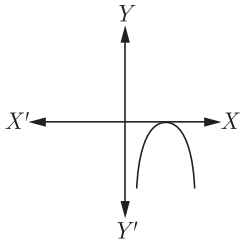
Sol : www.cbse.site/ma/bm120

21. Which of the following is not the graph of a quadratic polynomial?

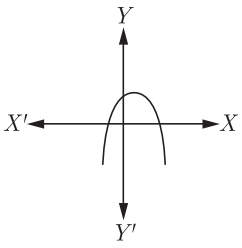
(a)



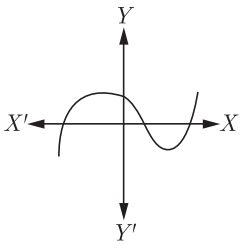
(b)



(c)



(d)



Sol : www.cbse.site/ma/bm121

22. **Assertion :** $(2-\sqrt{3})$ is one zero of the quadratic polynomial then other zero will be $(2+\sqrt{3})$.
Reason : Irrational zeros (roots) always occurs in pairs.
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

Sol : www.cbse.site/ma/bm122

23. **Assertion :** If one zero of poly-nominal $p(x)=(k^2+4)x^2+13x+4k$ is reciprocal of other, then $k=2$.
Reason : If $(x-\alpha)$ is a factor of $p(x)$, then $p(\alpha)=0$ i.e. α is a zero of $p(x)$.
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

Sol : www.cbse.site/ma/bm123

24. **Assertion :** $p(x)=14x^3-2x^2+8x^4+7x-8$ is a polynomial of degree 3.
Reason : The highest power of x in the polynomial $p(x)$ is the degree of the polynomial.
(a) Both assertion (A) and reason (R) are true and

reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Sol : www.cbse.site/ma/bm124

25. **Assertion :** $x^3 + x$ has only one real zero.

Reason : A polynomial of n th degree must have n real zeroes.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Sol : www.cbse.site/ma/bm125

26. **Assertion :** If both zeros of the quadratic polynomial $x^2 - 2kx + 2$ are equal in magnitude but opposite in sign then value of k is ½.

Reason : Sum of zeros of a quadratic polynomial $ax^2 + bx + c$ is $\frac{-b}{a}$

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

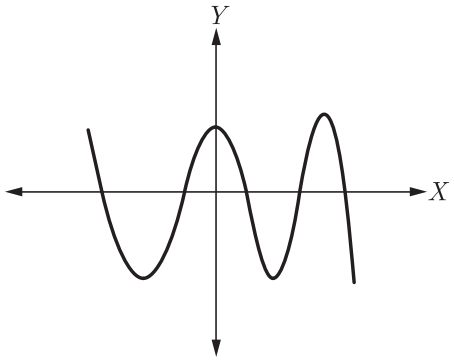
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Sol : www.cbse.site/ma/bm126

27. The graph of $y = p(x)$, where $p(x)$ is a polynomial in variable x, is as follows.



The number of zeroes of $p(x)$ is ..... .

(a) 2

(b) 3

(c) 4

(d) 5

Sol : www.cbse.site/ma/bm127

28. If one root of the equation $(k-1)x^2 - 10x + 3 = 0$ is the reciprocal of the other then the value of k is .....

(a) 2

(b) 3

(c) 4

(d) 5

Sol : www.cbse.site/ma/bm128

29. If α and β are the roots of $ax^2 - bx + c = 0 (a \neq 0)$, then value of $\alpha + \beta$ is

(a) $\frac{b}{a}$

(b) $\frac{a}{b}$

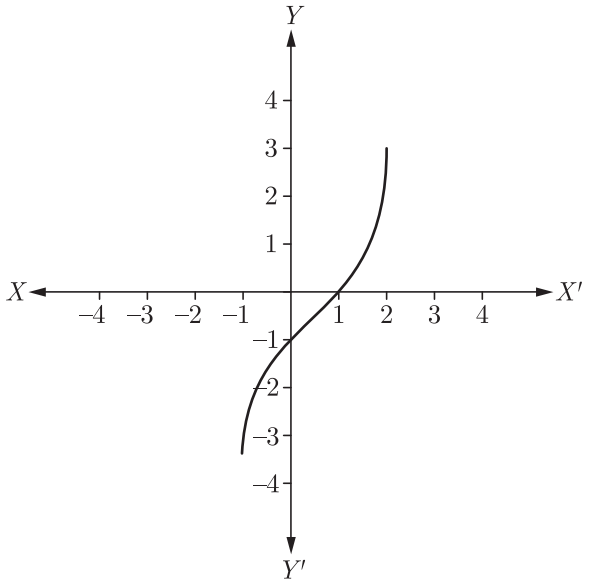
(c) $\frac{2a}{b}$

(d) $\frac{a}{2b}$

Sol : www.cbse.site/ma/bm129

30. In given figure, the graph of a polynomial $p(x)$ is

shown. The number of zeroes of $p(x)$ will be



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

Sol : www.cbse.site/ma/bm130

31. If sum of the zeroes of the quadratic polynomial $3x^2 - kx + 6$ is 3, then the value of k will be
(a) 1
(b) 4
(c) 6
(d) 9

Sol : www.cbse.site/ma/bm131

32. The zeroes of the polynomial $p(x) = 4x^2 - 12x + 9$ will be
(a) $\frac{3}{2}$ and $\frac{3}{2}$
(b) $\frac{2}{3}$ and $\frac{1}{3}$
(c) $\frac{2}{3}$ and $\frac{1}{3}$
(d) $\frac{1}{3}$ and $\frac{1}{3}$

Sol : www.cbse.site/ma/bm132

33. If -1 is a zero of the polynomial $f(x) = x^2 - 7x - 8$, then other zero is
(a) 4
(b) 8
(c) 1
(d) –4

Sol : www.cbse.site/ma/bm133

34. If α and β are the zeroes the polynomial $2x^2 - 4x + 5$, the value of $\alpha^2 + \beta^2$ is
(a) -7
(b) 1
(c) -1
(d) -6

Sol : www.cbse.site/ma/bm134

35. If zeroes of the polynomial $x^2 + 4x + 2a$ are a and $\frac{2}{a}$, then the value of a is
(a) 1
(b) 2
(c) 3
(d) 4

Sol : www.cbse.site/ma/bm135

36. Zeroes of $f(x) = x^2 - 2x$ are
(a) 2 and 4
(b) 1 and 3
(c) 0 and 2
(d) 0 and 4

Sol : www.cbse.site/ma/bm136

37. The zeroes of the quadratic polynomial $\sqrt{3}\,x^2 - 8x + 4\sqrt{3}$ are
(a) $2\sqrt{3}$ and $\sqrt{3}$
(b) $2\sqrt{3}$ and $\frac{1}{\sqrt{3}}$
(c) $\frac{1}{\sqrt{3}}$ and $\sqrt{3}$
(d) $\frac{2}{\sqrt{3}}$ and $2\sqrt{3}$

Sol : www.cbse.site/ma/bm137

38. If p and q are the zeroes of polynomial $f(x) = 2x^2 - 7x + 3$, the value of $p^2 + q^2$ will be
(a) $\frac{39}{5}$
(b) $\frac{5}{39}$
(c) $\frac{37}{4}$
(d) $\frac{4}{37}$

Sol : www.cbse.site/ma/bm138

39. The zeroes of polynomial $p(x) = ax^2 + bx + c$ are reciprocal of each other if
(a) $b = 2a$
(b) $c = b$
(c) $b = a$
(d) $c = a$

Sol : www.cbse.site/ma/bm139

40. If α and β are the zeroes the polynomial $2x^2 - 4x + 5$, the value of $(\alpha - \beta)^2$ is
(a) 2
(b) 1
(c) -1
(d) -6

Sol : www.cbse.site/ma/bm140

41. Select the quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $f(x) = ax^2 + bx + c$, $a \neq 0$, $c \neq 0$.
(a) $bx^2 + ax + c$
(b) $ax^2 + cx + b$
(c) $cx^2 + bx + a$
(d) $bx^2 + cx + a$

Sol : www.cbse.site/ma/bm141

42. Which of the following are the zeroes of the polynomial $p(x) = 2x^3 - 11x^2 + 17x - 6$.
(a) 2
(b) 3
(c) $\frac{1}{2}$
(d) Above all

Sol : www.cbse.site/ma/bm142

Direction For Question : (43-44)

A teacher asked 10 of his students to write a polynomial in one variable on a paper and then to handover the paper. The following were the answers given by the students :

$2x + 3$, $3x^2 + 7x + 2$, $4x^3 + 3x^2 + 2$, $x^3 + \sqrt{3x} + 7$, $7x + \sqrt{7}$, $5x^3 - 7x + 2$, $2x^2 + 3 - \frac{5}{x}$, $5x - \frac{1}{2}$, $ax^3 + bx^2 + cx + d$, $x + \frac{1}{x}$.

43. How many of the above ten, are not polynomials?
(a) 2
(b) 3
(c) 4
(d) 5

Sol : www.cbse.site/ma/bm143

44. How many of the above ten, are quadratic polynomials?
(a) 1
(b) 2
(c) 3
(d) 4

Sol : www.cbse.site/ma/bm143

45. Given that α and β are the zeroes of a quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$. Select the quadratic polynomial having α and β as its zeroes.
(a) $x^2 - 128x + 24$
(b) $x^2 - 24x + 128$
(c) $x^2 + 24x - 128$
(d) $x^2 + 128x + 24$

Sol : www.cbse.site/ma/bm144

COMPETENCEY BASED QUESTIONS

46. R K Agrawal is designing a propylene tank in the shape of a cylinder with hemispherical ends. If the length of the cylinder is to be 20 unit larger than its radius and the volume is to be 3321π cubic unit,

then what is the radius?

(a) 5 unit
(b) 7 unit
(c) 9 unit
(d) 13 unit

Sol : www.cbse.site/ma/bm145

Direction For Question : (47-50)

For the box to satisfy certain requirements, its length must be three unit greater than the width, and its height must be two unit less than the width.

47. If width is taken as x, find the polynomial that represent volume of box.
(a) $6x^2+4x-12$
(b) $5x^2+3x-12$
(c) x^3+x^2-6x
(d) $4x^2+2x+4$

Sol : www.cbse.site/ma/bm146

48. Find the polynomial that represent the area of paper sheet used to make box.
(a) $6x^2+4x-12$
(b) $5x^2+3x-12$
(c) x^3+x^2-6x
(d) $4x^2+2x+4$

Sol : www.cbse.site/ma/bm146

49. If it must have a volume of 18 unit, what must be its length and height ?
(a) 6 and 1
(b) 5 and 2
(c) 6 and 2
(d) 5 and 3

Sol : www.cbse.site/ma/bm146

50. If box is made of a paper sheet which cost is ₹ 100 per square unit, what is the cost of paper?
(a) ₹ 2100
(b) ₹ 4200
(c) ₹ 2800
(d) ₹ 5400

Sol : www.cbse.site/ma/bm146

Direction For Question : (51-54)

The volume of water in a rectangular, in-ground, swimming pool is given by $V(x)=x^3+11x^2+24x$ where $V(x)$ is the volume in cubic feet when the water is x ft high.

51. What is the dimension of base of pool?
(a) $x+3$ and $x+8$
(b) $x+4$ and $x+7$
(c) $x+4$ and $x+8$

(d) $x+3$ and $x+7$

Sol : www.cbse.site/ma/bm147

52. What is the volume of pool when $x=3$ ft?
(a) 298 ft^3
(b) 148 ft^3
(c) 268 ft^3
(d) 198 ft^3

Sol : www.cbse.site/ma/bm147

53. If the volume is 100 ft^3 of water, what is the height x ?
(a) 2 ft
(b) 3 ft
(c) 4 ft
(d) 5 ft

Sol : www.cbse.site/ma/bm147

54. If the maximum capacity of the pool is 520 ft^3 what is the maximum depth?
(a) 2 ft
(b) 3 ft
(c) 4 ft
(d) 5 ft

Sol : www.cbse.site/ma/bm147

Direction For Question : (55-56)

Frozen specimens are stored in a cubic metal box that is x inches on each side. The box is surrounded by a 2 inch thick layer of foam insulation.

55. Which of the following polynomial function $V(x)$ gives the total volume in cubic inches for the box and insulation?
(a) $x^3+48x^2+12x+32$
(b) $x^3+48x^2+12x+64$
(c) $x^3+12x^2+48x+64$
(d) $x^3+12x^2+48x+32$

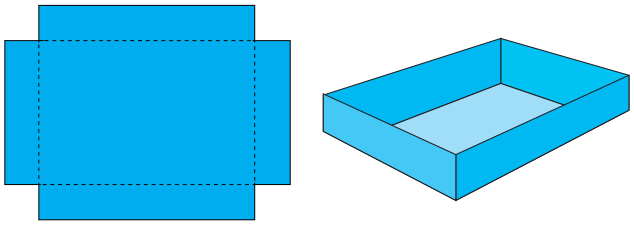
Sol : www.cbse.site/ma/bm148

56. What is the total volume if x is 10 inches?
(a) 1468 in^3
(b) 2744 in^3
(c) 1972 in^3
(d) 2146 in^3

Sol : www.cbse.site/ma/bm148

Direction For Question : (57-58)

A metalworker makes an overflow pan by cutting equal squares with sides of length x from the corners of a 30 cm by 20 cm piece of aluminium, as shown in the figure. The sides are then folded up and the corners sealed.



57. Which of the following polynomial function $V(x)$ gives the volume of the pan?
(a) $4x^3-60x^2+450x$
(b) $4x^3-100x^2+600x$
(c) $4x^3-50x^2+600x$
(d) $4x^3-60x^2+500x$

Sol : www.cbse.site/ma/bm149

58. What is volume of the pan if the height is 6 cm?
(a) 518 cm^3
(b) 746 cm^3
(c) 648 cm^3
(d) 864 cm^3

Sol : www.cbse.site/ma/bm149

Direction For Question : (59-60)

Suppose that the pan in previous example is formed from a square piece of aluminium that is 30 cm on each side.

59. Which of the following polynomial function $V(x)$

gives the volume in cubic cm?

(a) $4x^3 - 120x^2 + 900x$

(b) $4x^3 - 900x^2 + 600x$

(c) $4x^3 + 120x^2 + 600x$

(d) $4x^3 - 900x^2 + 300x$

Sol : www.cbse.site/ma/bm150

60. The cost is Rs 5 per square cm of aluminum used in the finished pan. Which of the following polynomial function $C(x)$ gives the cost?

(a) $20x^2 + 2500$

(b) $20x^2 + 3500$

(c) $20x^2 + 4500$

(d) $-20x^2 + 4500$

Sol : www.cbse.site/ma/bm150

Direction For Question : (61-62)

The discharge rate of a river is a measure of the river's water flow as it empties into a lake, sea, or ocean. The rate depends on many factors, but is primarily influenced by the precipitation in the surrounding area and is often seasonal.

Suppose the discharge rate of the Brhamputra River was modelled by $D(m) = -m^4 + 22m^3 - 147m^2 + 317m + 150$ where $D(m)$ represents the discharge rate in thousands of cubic meters of water per second in month m.

$(m = 1 \to \text{Jan}, m = 2 \to \text{Feb})$

61. What was the discharge rate in June (summer heat) ?

(a) 166 thousand cubic meter per second

(b) 146 thousand cubic meter per second

(c) 246 thousand cubic meter per second

(d) 216 thousand cubic meter per second

Sol : www.cbse.site/ma/bm151

62. Is the discharge rate higher in June or October?

(a) The discharge rate in October is 420 thousand cubic meter per second which is much higher than discharge in June.

(b) The discharge rate in October is 120 thousand cubic meter per second which is much lower than discharge in June.

(c) The discharge rate in October is 620 thousand cubic meter per second which is much higher than discharge in June.

(d) The discharge rate in October is 60 thousand cubic meter per second which is much lower than discharge in June.

Sol : www.cbse.site/ma/bm151

Direction For Question : (63-65)

A company makes rectangular shaped bird cages with height b inches and square bottoms. The volume of these cages is given by the function $V = b^3 - 6b^2 + 9b$

63. Which of the following expression the length of each side of the square bottom?

(a) $(b-2)$

(b) $(b-3)$

(c) $(b-4)$

(d) $(b-5)$

Sol : www.cbse.site/ma/bm152

64. What is the volume of a cage with a height of 18 inches?

(a) 3050 in^2

(b) 2050 in^2

(c) 1050 in^2

(d) 4050 in^2

Sol : www.cbse.site/ma/bm152

65. What is the volume of a cage with a height of 15 inches?

(a) 2160 in^2

(b) 2250 in^2

(c) 1150 in^2

(d) 4350 in^2

Sol : www.cbse.site/ma/bm152

Direction For Question : (66-67)

An independent marketing research agency has determined that the best box for breakfast cereal has a height that is 6 inches larger than its thickness and a width that is 5 inches larger than its thickness.

66. If we let the thickness be x inches, select the polynomial function $V(x)$ that gives the total volume.

(a) x^3+30x^2+11x

(b) x^3+11x^2+30x

(c) x^3+15x^2+20x

(d) x^3+20x^2+15x

Sol : www.cbse.site/ma/bm153

67. If such a box is to have a volume of 112 $inches^3$, then what should the thickness be?

(a) 1 inch

(b) 2 inch

(c) 3 inch

(d) 4 inch

Sol : www.cbse.site/ma/bm153

68. The number of soda cans S needed to build a square pyramid display with n levels is given by the function $L(n)=\frac{1}{3}n^3+\frac{1}{2}n^2+\frac{1}{6}n$. How many soda cans needed to build a square pyramid display with $n=6$ levels?

(a) 16

(b) 72

(c) 75

(d) 91

Sol : www.cbse.site/ma/bm154

Direction For Question : (69-70)

A bulk dog food storage bin with dimensions 2 feet by 3 feet by 4 feet needs to be increased in size to hold five times as much food as the current bin. Assume

each dimension is increased by the same amount.

69. Let x be the amount by which dimension is increased. Write of the following function represents the volume of the new bin?

(a) $x^3+36x^2+12x+16$

(b) $x^3+16x^2+9x+16$

(c) $x^3+26x^2+9x+24$

(d) $x^3+9x^2+26x+24$

Sol : www.cbse.site/ma/bm155

70. What is the dimensions of the new bin?

(a) 4 feet, 5 feet and 5 feet.

(b) 5 feet, 6 feet and 7 feet.

(c) 4 feet, 5 feet and 6 feet.

(d) 5 feet, 5 feet and 6 feet.

Sol : www.cbse.site/ma/bm155

Direction For Question : (71-74)

The cost to produce bottled spring water is given by $C(x)=16x-63$ where x is the number of thousands of bottles. The total income (revenue) from the sale of these bottles is given by the function $R(x)=-x^2+326x-7463$.

71. Since Profit = Revenue − Cost, the profit function would be

(a) $-x^2+210x-2400$

(b) $-x^2+210x-7400$

(c) $-x^2+310x-7400$

(d) $-x^2-310x+7400$

Sol : www.cbse.site/ma/bm156

72. How many bottles sold will produce the maximum profit?

(a) 125

(b) 155

(c) 175

(d) 185

Sol : www.cbse.site/ma/bm156

73. What is the maximum profit?

(a) Rs 14625

(b) Rs 16625

(c) Rs 22645

(d) Rs 14685

Sol : www.cbse.site/ma/bm156

74. What is the profit when 245 thousand bottles are sold?

(a) Rs 8525

(b) Rs 9225

(c) Rs 12645

(d) Rs 10685

Sol : www.cbse.site/ma/bm156

75. A bride-to-be has many girlfriends, but she has decided to have only five bridesmaids, including the maid of honor. The number of different ways n girlfriends can be chosen and assigned a position, such as maid of honor, first bridesmaid, second bridesmaid, and so on, is given by the polynomial function

$S(n) = n^5 - 10n^4 + 35n^3 - 50n^2 + 8n \quad n \geq 5$

How many ways the bride can select her bridesmaids if she chooses from $n = 5$ girlfriends?

(a) 40

(b) 45

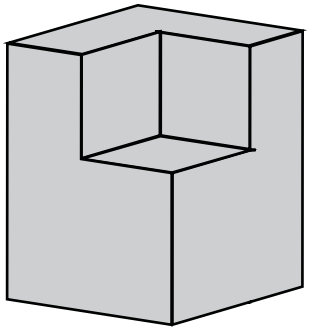
(c) 25

(d) 18

Sol : www.cbse.site/ma/bm157

Direction For Question : (76-78)

A cuboidal solid of base x by $x+1$ is shown in figure. Height of original solid is $x+2$. A small cuboidal solid of base $x-2$ by $x-2$ and height 2 is cut from this solid as shown in figure.



76. Which of the following is correct polynomial for the volume of remaining solid?

(a) $x^3 + x^2 - 10x - 8$

(b) $x^3 + x^2 - 10x + 8$

(c) $x^3 + x^2 + 10x + 8$

(d) $x^3 + x^2 + 10x - 8$

Sol : www.cbse.site/ma/bm158

77. What is the volume of remaining solid at $x = 8$ inch?

(a) 432 cubic inch

(b) 648 cubic inch

(c) 712 cubic inch

(d) 568 cubic inch

Sol : www.cbse.site/ma/bm158

78. What is the volume of remaining solid at $x = 10$ inch?

(a) 1242 cubic inch

(b) 1458 cubic inch

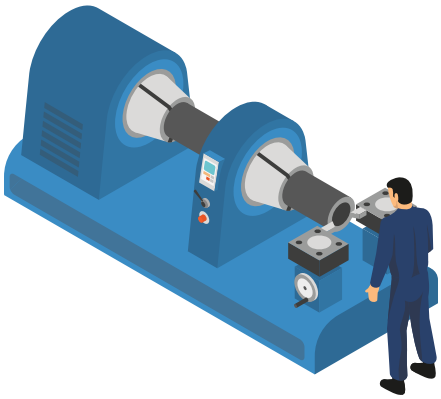
(c) 1712 cubic inch

(d) 1192 cubic inch

Sol : www.cbse.site/ma/bm158

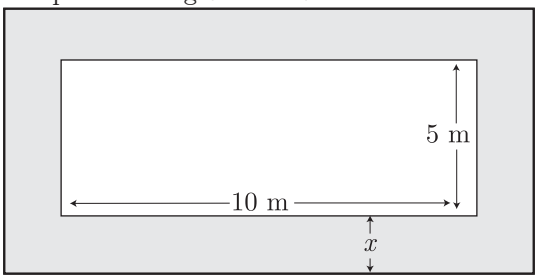
Direction For Question : (79-83)

RK Fabricators has got a order for making a frame for machine of their client. For which, they are using a AutoCAD software to create a constructible model that includes the relevant information such as dimensions of the frame and materials needed.



The frame will have a solid base and will be cut out

of a piece of steel. The final area of the frame should be 54 sq m. The digram of frame is shown below.



In order to input the right values in the AutoCAD software, the engineer needs to calculate some basic values.

79. What are the dimensions of the outer frame ?
(a) $(10+x)$ and $(5+x)$
(b) $(10-x)$ and $(5-x)$
(c) $(10+2x)$ and $(5+2x)$
(d) $(10-2x)$ and $(5-2x)$

Sol : www.cbse.site/ma/bm159

80. A metal sheet of minimum area is used to make the frame. What should be the minimum area of metal sheet before cutting ?
(a) $4x^2+30x+50$
(b) $x^2+27x+55$
(c) $5x^2+30$
(d) $4x^2+50$

Sol : www.cbse.site/ma/bm159

81. What is the area of required final metal frame ?
(a) $4x^2+30x+50\ \text{m}^2$
(b) $x^2+27x+55\ \text{m}^2$
(c) $4x^2+50x\ \text{m}^2$
(d) $4x^2+30x\ \text{m}^2$

Sol : www.cbse.site/ma/bm159

82. If the area of the frame is 54 sq m, what is the value of x ?
(a) 0.75 m
(b) 3.0 m
(c) 1.5 m
(d) 1.8 m

Sol : www.cbse.site/ma/bm159

83. What is the perimeter of the frame?
(a) 36 m
(b) 42 m
(c) 45 m
(d) 39 m

Sol : www.cbse.site/ma/bm159

Direction For Question : (84-88)

The Prime Minister's Citizen Assistance and Relief in Emergency Situations Fund was created on 28 March 2020, following the COVID-19 pandemic in India. The fund will be used for combating, and containment and relief efforts against the coronavirus outbreak and similar pandemic like situations in the future.

The allotment officer is trying to come up with a method to calculate fair division of funds across various affected families so that the fund amount and amount received per family can be easily adjusted based on daily revised numbers. The total fund allotted for a village is $x^3+6x^2+20x+9$. The officer has divided the fund equally among families of the village and each family receives an amount of x^2+2x+2. After distribution, some amount is left.

84. How many families are there in the village?
(a) $x+4$
(b) $x-3$
(c) $x-4$
(d) $x+3$

Sol : www.cbse.site/ma/bm160

85. If an amount of ₹1911 is left after distribution, what is value of x?
(a) 190
(b) 290
(c) 191
(d) 291

Sol : www.cbse.site/ma/bm160

86. How much amount does each family receive?
(a) 24490
(b) 34860
(c) 22540
(d) 36865

Sol : www.cbse.site/ma/bm160

87. What is the amount of fund allocated?
(a) ₹ 72 72 759
(b) ₹ 75 72 681
(c) ₹ 69 72 846
(d) ₹ 82 74 888

Sol : www.cbse.site/ma/bm160

88. How many families are there in the village?
(a) 191
(b) 98
(c) 187
(d) 195

Sol : www.cbse.site/ma/bm160

Direction For Question : (89-93)

An barrels manufacturer can produce up to 300 barrels per day. The profit made from the sale of these barrels can be modelled by the function $P(x) = -10x^2 + 3500x - 66000$ where $P(x)$ is the profit in rupees and x is the number of barrels made and sold.

Based on this model answer the following questions:

89. When no barrels are produce what is a profit loss?
(a) ₹ 22000
(b) ₹ 66000
(c) ₹ 11000
(d) ₹ 33000

Sol : www.cbse.site/ma/bm161

90. What is the break even point ? (Zero profit point is called break even)
(a) 10 barrels
(b) 30 barrels
(c) 20 barrels
(d) 100 barrels

Sol : www.cbse.site/ma/bm161

91. What is the profit/loss if 175 barrels are produced
(a) Profit 266200
(b) Loss 266200
(c) Profit 240250
(d) Loss 240250

Sol : www.cbse.site/ma/bm161

92. What is the profit/loss if 400 barrels are produced
(a) Profit ₹ 466200
(b) Loss ₹ 266000
(c) Profit ₹ 342000
(d) Loss ₹ 342000

Sol : www.cbse.site/ma/bm161

93. What is the maximum profit which can manufacturer earn?

(a) ₹ 240250

(b) ₹ 480500

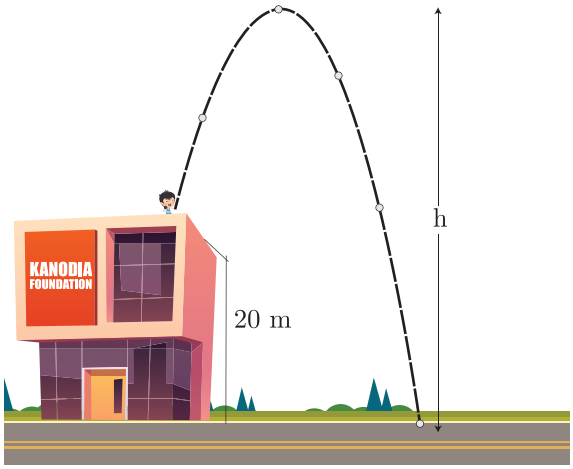
(c) ₹ 680250

(d) ₹ 240250

Sol : www.cbse.site/ma/bm161

Direction For Question : (94-98)

Lavanya throws a ball upwards, from a rooftop, which is 20 m above from ground. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time t is h , which is given by $h = -4t^2 + 16t + 20$.



94. What is the height reached by the ball after 1 second?

(a) 64 m

(b) 128 m

(c) 32 m

(d) 20 m

Sol : www.cbse.site/ma/bm162

95. What is the maximum height reached by the ball?

(a) 54 m

(b) 44 m

(c) 36 m

(d) 18 m

Sol : www.cbse.site/ma/bm162

96. How long will the ball take to hit the ground?

(a) 4 seconds

(b) 3 seconds

(c) 5 seconds

(d) 6 seconds

Sol : www.cbse.site/ma/bm162

97. What are the two possible times to reach the ball at the same height of 32 m?

(a) 1 and 3 seconds

(b) 1 and 4 seconds

(c) 1 and 2 seconds

(d) 1 and 5 seconds

Sol : www.cbse.site/ma/bm162

98. Where is the ball after 5 seconds ?

(a) at the ground

(b) rebounds

(c) at highest point

(d) fall back

Sol : www.cbse.site/ma/bm162

Direction For Question : (99-103)

Pyramid, in architecture, a monumental structure constructed of or faced with stone or brick and having a rectangular base and four sloping triangular sides meeting at an apex. Pyramids have been built at various times in Egypt, Sudan, Ethiopia, western Asia, Greece, Cyprus, Italy, India, Thailand, Mexico, South America, and on some islands of the Pacific Ocean. Those of Egypt and of Central and South America are the best known.

The volume and surface area of a pyramid with a square base of area a^2 and height h is given by

$$V = \frac{ha^2}{3} \text{ and } S = a^2 + 2a\sqrt{\left(\frac{a}{2}\right)^2 + h^2}$$

A pyramid has a square base and a volume of $3y^3 + 18y^2 + 27y$ cubic units.

99. If its height is y, then what polynomial represents the length of a side of the square base ?

(a) $9(y+3)$

(b) $9(y+3)^2$

(c) $3(y+3)$

(d) $3(y+3)^2$

Sol : www.cbse.site/ma/bm163

100. If area of base is 576 metre, what is the side of base?

(a) 24 metre

(b) 16 metre

(c) 13 metre

(d) 12 metre

Sol : www.cbse.site/ma/bm163

101. What is the height of pyramid at above area of base?

(a) 4 metre

(b) 6 metre

(c) 5 metre

(d) 12 metre

Sol : www.cbse.site/ma/bm163

102. What is the ratio of length of side to the height ?

(a) $\frac{1}{5}$

(b) $\frac{2}{5}$

(c) $\frac{5}{24}$

(d) $\frac{24}{5}$

Sol : www.cbse.site/ma/bm163

103. What is surface area of pyramid ?

(a) 800 m^2

(b) 2400 m^2

(c) 1200 m^2

(d) 1600 m^2

Sol : www.cbse.site/ma/bm163

Direction For Question : (104-108)

Underground water tank is very popular in India. It is usually used for large water tank storage and can be built cheaply using cement-like materials. Underground water tank are typically chosen by people who want to save space. The water in the underground water tank is not affected by extreme weather conditions. The underground water tank maintain cool temperatures in both winter and summer.

A builder wants to build a tank to store water in an apartment. The volume of the rectangular tank will be modelled by $V(x) = x^3 + x^2 - 4x - 4$.

104. He planned in such a way that its base dimensions are $(x+1)$ and $(x+2)$. How much he has to dig ?

(a) $(x+1)$

(b) $(x-2)$

(c) $(x-3)$

(d) $(x+2)$

Sol : www.cbse.site/ma/bm164

105. If $x=4$ meter, what is the volume of the water tank?
(a) 30 m^3
(b) 20 m^3
(c) 15 m^3
(d) 60 m^3

Sol : www.cbse.site/ma/bm164

106. If $x=4$ and the builder wants to paint the entire inner portion on the water tank, what is the total area to be painted ?
(a) 52 m^2
(b) 96 m^2
(c) 208 m^2
(d) 104 m^2

Sol : www.cbse.site/ma/bm164

107. If the cost of paint is ₹ 25/ per square metre, what is the cost of painting ?
(a) ₹ 3900
(b) ₹ 2600
(c) ₹ 1300
(d) ₹ 5200

Sol : www.cbse.site/ma/bm164

108. What is the storage capacity of this water tank ?
(a) 3000 litre
(b) 6000 litre
(c) 60000 litre
(d) 30000 litre

Sol : www.cbse.site/ma/bm164

109. If α and β are the zeroes the polynomial $2x^2-4x+5$, the value of $\frac{1}{\alpha^2}+\frac{1}{\beta^2}$ is
(a) $\frac{4}{25}$
(b) $-\frac{4}{25}$
(c) $\frac{4}{5}$
(d) $-\frac{4}{5}$

Solution is given in hard book.

110. The sum and product of zeroes of a quadratic polynomial are 6 and 9 respectively. The quadratic polynomial will be
(a) x^2+9x-6
(b) x^2+6x+9
(c) x^2-6x+9
(d) x^2+6x-9

Solution is given in hard book.

111. Select the quadratic polynomial whose sum and product of a the zeroes are $\frac{21}{8}$ and $\frac{5}{16}$ respectively
(a) $16x^2-42x+5$
(b) $\frac{1}{16}(16x^2-42x+5)$
(c) $\frac{1}{12}(16x^2+42x+5)$
(d) $\frac{1}{12}(16x^2+42x-5)$

Solution is given in hard book.

112. Select the quadratic polynomial $p(x)$ with 3 and $-\frac{2}{5}$ as sum and product of its zeroes, respectively.
(a) $x^2-3x-\frac{2}{5}$
(b) x^2-3x-2
(c) $5x^2-15x-2$
(d) $15x^2-5x+\frac{2}{5}$

Sol : www.cbse.site/ma/bm212

113. If m and n are the zeroes of the polynomial $3x^2+11x-4$, then value of $\frac{m}{n}+\frac{n}{m}$ will be
(a) $\frac{12}{145}$
(b) $-\frac{12}{145}$
(c) $-\frac{145}{12}$
(d) $\frac{145}{12}$

Solution is given in hard book.

114. If -1 is a zero of the polynomial $p(x)=kx^2-4x+k$, the value of k is
(a) –4

(b) –2
(c) 2
(d) 4

Solution is given in hard book.

115. If α and β are the zeroes of a polynomial $x^2 - 4\sqrt{3}\,x + 3$, then the value of $\alpha + \beta - \alpha\beta$ will be
(a) $\sqrt{3}(2 - \sqrt{3})$
(b) $\sqrt{3}(2 + \sqrt{3})$
(c) $\sqrt{3}(4 + \sqrt{3})$
(d) $\sqrt{3}(4 - \sqrt{3})$

Solution is given in hard book.

116. If a and b are the zeroes of polynomial $x^2 + ax + b$, the values of a and b are
(a) 1 and 2
(b) 1 and –2
(c) –2 and 1
(d) 2 and 1

Solution is given in hard book.

117. The zeroes of the quadratic polynomial $x^2 - 2\sqrt{2}\,x$ are
(a) 1 and $2\sqrt{2}$
(b) 0 and $2\sqrt{2}$
(c) 0 and 1
(d) 1 and 2

Solution is given in hard book.

118. The zeroes of the quadratic polynomial $5x^2 + 8x - 4$ are
(a) –2 and $\frac{2}{5}$
(b) –3 and $\frac{5}{2}$
(c) $-\frac{3}{2}$ and $\frac{1}{2}$
(d) $\frac{1}{2}$ and $\frac{3}{2}$

Solution is given in hard book.

119. If α and β are the zeroes the polynomial $2x^2 - 4x + 5$, the value of $\alpha^2 + \beta^2$ is
(a) 2
(b) 1
(c) -1
(d) -6

Solution is given in hard book.

120. If one zero of the polynomial $2x^2 + 3x + \lambda$ is $\frac{1}{2}$, what is the value of λ and the other zero?
(a) –2 and –2
(b) –3 and –3
(c) –2 and –3
(d) –3 and –2

Solution is given in hard book.

121. If α and β are zeroes of the polynomial $f(x) = x^2 - x - k$, such that $\alpha - \beta = 9$, the value of k will be
(a) 20
(b) 30
(c) 60
(d) 18

Solution is given in hard book.

122. If α,β and γ are zeroes of the polynomial $6x^3 + 3x^2 - 5x + 1$, then value of $\alpha^{-1} + \beta^{-1} + \gamma^{-1}$ will be
(a) 5
(b) 4
(c) 3
(d) 2

Solution is given in hard book.

123. When $p(x) = x^2 + 7x + 9$ is divisible by $g(x)$, we get $(x + 2)$ and -1 as the quotient and remainder respectively. The polynomial $g(x)$ will be
(a) $x + 2$
(b) $x - 1$
(c) $x + 6$
(d) $x + 5$

Solution is given in hard book.

124. Select the value for k for which $x^4+10x^3+25x^2+15x+k$ is exactly divisible by $x+7$.
(a) –102
(b) –91
(c) –103
(d) –104

Solution is given in hard book.

125. On dividing the polynomial $4x^4-5x^3-39x^2-46x-2$ by the polynomial $g(x)$, the quotient is x^2-3x-5 and the remainder is $-5x+8$. The polynomial $g(x)$ will be
(a) $2x^2+7x+1$
(b) $2x^2-7x+2$
(c) $4x^2+7x+2$
(d) $2x^2+7x+1$

Solution is given in hard book.

126. If the squared difference of the zeroes of the quadratic polynomial $f(x)=x^2+px+45$ is equal to 144, the value of p will be
(a) 21
(b) 18
(c) –21
(d) –31

Solution is given in hard book.

127. If the zeroes of the polynomial x^2+px+q are double in value to the zeroes of $2x^2-5x-3$, the value of p and q will be
(a) –2 and –3
(b) –6 and –5
(c) –5 and –6
(d) –3 and –2

Solution is given in hard book.

128. If α and β are zeroes of $x^2-(k-6)x+2(2k-1)$, such that $\alpha+\beta=\frac{1}{2}\alpha\beta$, value of k will be
(a) –2
(b) 0
(c) 3
(d) –5

Solution is given in hard book.

Direction For Question : (21-22)
Polynomial $x^4+7x^3+7x^2+px+q$ is exactly divisible by $x^2+7x+12$.

129. The value of p will be
(a) -35
(b) -25
(c) -15
(d) -60

Solution is given in hard book.

130. The value of q will be
(a) -35
(b) -25
(c) -15
(d) -60

Solution is given in hard book.

131. If α and β are the zeroes of the polynomial $p(x)=2x^2+5x+k$ satisfying the relation, $\alpha^2+\beta^2+\alpha\beta=\frac{21}{4}$, then find the value of k.
(a) 4
(b) 3
(c) 2
(d) 1

Solution is given in hard book.

Direction For Question : (132-133)
Let α and β are the zeroes of polynomial $p(x)=3x^2+2x+1$. Let α_1 and β_1 are zeroes of new polynomial $q(x)$ where $\alpha_1=\frac{1-\alpha}{1+\alpha}$ and $\beta_1=\frac{1-\beta}{1+\beta}$.

132. Which of the following is the value of $\alpha_1+\beta_1$?
(a) 1
(b) 2
(c) 3
(d) 4

Solution is given in hard book.

133. Which of the following is the value of $\alpha_1\beta_1$?
(a) 1
(b) 2
(c) 3
(d) 4

Solution is given in hard book.

134. Which of the following is the polynomial $q(x)$?
(a) x^2+3x-2
(b) x^2-3x+2
(c) x^2-2x+3
(d) x^2+2x-3

Solution is given in hard book.

Direction For Question : (135-136)
Let α and β are the zeroes of polynomial x^2+4x+3 , Let α_1 and β_1 are zeroes of new polynomial $q(x)$ where $\alpha_1=1+\frac{\beta}{\alpha}$ and $\beta_1=1+\frac{\alpha}{\beta}$.

135. Which of the following is the value of $\alpha_1+\beta_1$?
(a) $\frac{16}{3}$
(b) $\frac{16}{5}$
(c) $\frac{14}{3}$
(d) $\frac{14}{5}$

Solution is given in hard book.

136. Which of the following is the value of $\alpha_1\beta_1$?
(a) $\frac{16}{3}$
(b) $\frac{16}{5}$
(c) $\frac{14}{3}$
(d) $\frac{14}{5}$

Solution is given in hard book.

137. Which of the following is the polynomial $q(x)$?
(a) $\frac{5}{3}x^2-\frac{16}{5}x+\frac{16}{5}$
(b) $3x^2-\frac{16}{3}x+\frac{16}{3}$
(c) $\frac{1}{3}(3x^2-16x+16)$
(d) $\frac{1}{5}(3x^2-16x+16)$

Solution is given in hard book.

138. If α and β are zeroes of the polynomial $p(x)=6x^2-5x+k$ such that $\alpha-\beta=\frac{1}{6}$, The value of k will be
(a) 1
(b) 2
(c) 3
(d) 4

Solution is given in hard book.

Direction For Question : (31-32)
Let β and $\frac{1}{\beta}$ are zeroes of the polynomial $(a^2+a)x^2+61x+6a$.

139. The value of a will be
(a) 2
(b) 4
(c) 5
(d) 7

Solution is given in hard book.

140. The value of β will be
(a) $\frac{6}{5}$
(b) $-\frac{5}{6}$
(c) 5
(d) 7

Solution is given in hard book.

141. If α and β are the zeroes of the polynomial $f(x)=x^2-6x+k$, such that $\alpha^2+\beta^2=40$. The value of k will be
(a) 0

(b) –4
(c) –2
(d) –3

Solution is given in hard book.

142. If one of the zeroes of the quadratic polynomial $f(x) = 14x^2 - 42k^2x - 9$ is negative of the other, the value of k is
(a) 0
(b) 1
(c) 2
(d) 3

Solution is given in hard book.

143. If the sum and product of the zeroes of the polynomial $ax^2 - 5x + c$ are equal to 10 each, the values of a and c are
(a) 6 and $\frac{3}{2}$
(b) $\frac{3}{2}$ and 6
(c) $\frac{1}{2}$ and 5
(d) 5 and $\frac{1}{2}$

Solution is given in hard book.

144. If one the zero of a polynomial $3x^2 - 8x + 2k + 1$ is seven times the other, the value of k will be
(a) $\frac{1}{3}$
(b) $\frac{2}{3}$
(c) $\frac{3}{2}$
(d) 0

Solution is given in hard book.

145. If α and β are the zeroes the polynomial $2x^2 - 4x + 5$, the value of $\frac{1}{\alpha} + \frac{1}{\beta}$ is
(a) $\frac{4}{25}$
(b) $-\frac{4}{25}$
(c) $\frac{4}{5}$
(d) $-\frac{4}{5}$

Solution is given in hard book.

146. Quadratic polynomial $2x^2 - 3x + 1$ has zeroes as α and β. Which of the following is the quadratic polynomial whose zeroes are 3α and 3β ?
(a) $2x + 9x - 9$
(b) $2x - 9x + 9$
(c) $x^2 - \frac{9}{2}x + \frac{9}{2}$
(d) $x^2 - 9x + 9$

Solution is given in hard book.

147. If α and β are the zeroes of the polynomial $6y^2 - 7y + 2$, Select the quadratic polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.
(a) $y^2 + 7y + 6$
(b) $y^2 + 7y - 6$
(c) $y^2 - 7y + 6$
(d) $y^2 - 3.5y + 3$

Solution is given in hard book.

148. The zeroes of the polynomial $4x^2 + 4x - 3$ is/are
(a) $\frac{1}{2}$
(b) $\frac{-3}{2}$
(c) both
(d) none

Solution is given in hard book.

****