ACADEMIC WORLD SCHOOL™
BEMETARA

SUMMER VACATION ASSIGNMENT
SESSION 2020-21
CLASS: X

SUBJECT- MATHEMATICS

General Instructions:

- *Attached assignments are based upon the video lectures prepared by the teachers.*
- *These video lectures are already uploaded on ERP.*
- *This assignment is part of internal assessment of Periodic Test 01.*
- *Solve all these questions in separate note book.*
- *As soon as School reopens, you will submit this assignment to your respective subject teacher.*

Chapter - 02 [Polynomials]

1. If $(x - 6)$ is a factor of $x^3 + ax^2 + bx - b = 0$ and $a - b = 7$, find the values of a and b.
2. If 2 and -3 are the zeroes of the polynomial $x^2 + (a + 1).x + b$, then find the value of a and b.
3. Obtain all zeroes of polynomial $f(x) = 2x^4+x^3-14x^2-19x-6$ if two of its zeroes are -2 and -1.
4. Find all the zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$, if two of its zeroes are $2 \pm \sqrt{3}$.
5. Find k so that $x^2 + 2x + k$ is a factor of $2x^4 + x^3 - 14x^2 + 5x + 6$. Also find all the zeroes of the two polynomials
6. If sum of the squares of zeroes of the quadratic polynomial $f(x) = x^2 - 8x + k$ is 40, find the value of k.
7. What must be subtracted from $8x^4 + 14x^3 - 2x^2 + 7x - 8$ so that the resulting polynomial is exactly divisible by $4x^2 + 3x - 2$
8. If the polynomial $f(x) = x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be $x + a$, find k and a.

Chapter - 03 [Pair of Linear Equations in Two Variables]

Solve for x and y:

9. $11x + 15y + 23 = 0$; $7x - 2y - 20 = 0$.

10. $2x + y = 7$; $4x - 3y + 1 = 0$.

11. $23x - 29y = 98$; $29x - 23y = 110$.

12. Meena went to a bank to withdraw Rs.2000. She asked the cashier to give her Rs.50 and Rs.100 notes only. Meena got 25 notes in all. Find how many notes of Rs.50 and Rs.100 she received.

13. The ratio of incomes of two persons is 9 :7 and the ratio of their expenditures is 4 : 3. If each of them manages to save Rs.2000 per month, find their monthly incomes.

14. The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is Rs.105 and for a journey of 15 km, the charge paid is Rs.155. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 25 km?

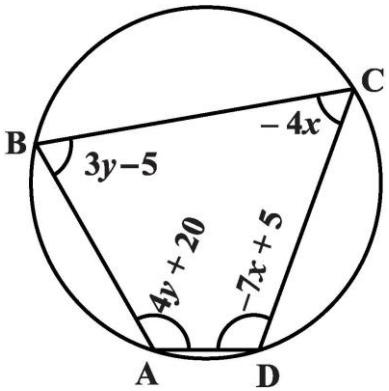
15 . 2 men and 7 boys can do a piece of work in 4 days. The same work is done in 3 days by 4 men and 4 boys. How long would it take one man and one boy to do it alone?

16. 2 women and 5 men can together finish an embroidery work in 4 days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the work, and also that taken by 1 man alone.

17. Find the four angles of a cyclic quadrilateral ABCD in which $\angle A = (2x - 1)^o$, $\angle B = (y + 5)^o$, $\angle C = (2y + 15)^o$ and $\angle D = (4x - 7)^o$.

18. The area of a rectangle remains the same if the length is increased by 7m and the breadth is decreased by 3m. The area remains unaffected if the length is decreased by 7m and the breadth is increased by 5m. Find the dimensions of the rectangle.

19. ABCD is a cyclic quadrilateral. Find the angles of the cyclic quadrilateral.



Chapter - 04 [Quadratic Equations]

20. Find the roots of the following quadratic equations by factorization method

    a) $x^2 - 3x - 10 = 0$ b) $2x^2 + x - 6 = 0$

21. Find two numbers whose sum is 27 and product is 182.

22. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

23. Find the roots of the following quadratic equations, if they exist, by the method of completing square:

    a) $2x^2 - 7x + 3 = 0$ c) $2x^2 + x - 4 = 0$

    b) $4x^2 + 4\sqrt{3}x + 3 = 0$ d) $2x^2 + x + 4 = 0$

24. Find the value of k for which following the quadratic equations has two real equal roots.

    (i) $2x^2 + kx + 3 = 0$ (ii) $kx.(x - 3) + 9 = 0$ (iii) $4x^2 - 3kx + 1 = 0$

25. If -4 is a root of the equation $x^2 + px - 4 = 0$ and the equation $x^2 + px + q = 0$ has equal roots, find the value of p and q.

26. If -5 is a root of the equation $2x^2 + px - 15 = 0$ and the equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k.

27. A passenger train takes 2 hours less for a journey of 300 km if its speed is increased by 5 km/hr from its usual speed. Find its usual speed. In a flight for 3000 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 100 km/hr and consequently time of flight increased by one hour. Find the original duration of flight.

Chapter- 05 [Arithmetic Progressions]

28. If $x + 1$, $3x$ and $4x + 2$ are in AP, find the value of x.

29. Find the value of x for which $(8x + 4)$, $(6x - 2)$ and $(2x + 7)$ are in AP.

30. Find the value of x for which $(5x + 2)$, $(4x - 1)$ and $(x + 2)$ are in AP.

31. Find the value of m so that $m + 2$, $4m - 6$ and $3m - 2$ are three consecutive terms of an AP.

32. Find the 20th term from the last term of the AP : 3, 8, 13, . . ., 253.

33. How many terms are there in the AP 7, 11, 15, ….. , 139?

34. Which term of the AP 3, 8, 13, 18,…… will be 55 more than its 20^{th} term?

35. The sum of 5^{th} term and 9^{th} term of an AP is 72 and the sum of 7^{th} and 12^{th} terms is 97. Find the AP.

36. The 8^{th} term of an AP is zero. Prove that its 38^{th} tem is triple its 18^{th} term.

37. If the 3rd and the 9th terms of an AP are 4 and -8 respectively, which term of this AP is zero?

38. What is the common difference of an A.P. in which $a_{21} - a_7 = 84$?

39. Which term of the progression 20, $19\frac{1}{4}$, $18\frac{1}{2}$, $17\frac{3}{4}$, . . . is the first negative term ?

40. If the ratio of the sum of the first 'n' terms of two A.Ps is $(7n + 1) : (4n + 27)$, then find the ratio of their 9th terms.

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