

KHAITAN PUBLIC SCHOOL, SAHIBABAD
HOLIDAY HOME WORK-2018
CLASS – X
MATHEMATICS

1. $4x^3 - 8x^2 + 8x + 1$ when divided by $g(x)$ gives $(2x-1)$ as quotient and $(x+3)$ as remainder. Find $g(x)$.
2. Find all the zeroes of the polynomial $f(x) = 2x^4 - 3x^3 - 5x^2 + 9x - 3$, it being given that two of its zeroes are $\sqrt{3}$ and $-\sqrt{3}$
3. Divide $12-17x-5x^2$ by $3-5x$ and verify the division algorithm.
4. It being given that 1 is one of the zeroes of the polynomial $7x - x^3 - 6$. Find its other zeroes.
5. 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 $x + a$. Find the values of k and a .
6. If the zeroes of the polynomial $x^3 - 3x^2 + x + 1$ are $a-b$, a and $a=b$, find the values of a and b .
7. If one zero of the polynomial $(a^2 + 9)x^2 + 13x + 6a$ is reciprocal of the other, find the value of a .
8. If the product of the zeroes of the polynomial $ax^2 - 6x - 6$ is 4, find the value of a .
9. If α, β are the zeroes of the polynomial $2x^2 - 5x + 3$ then form a polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$
10. Solve the following pair of equations for x and y , also find the value of 'm' such that $y = mx + 2$.
 $x + \frac{3}{y} = 5, 2x - \frac{6}{y} = 6$.
11. Solve for x and y : $23x + 37y = 143$ and $37x + 23y = 157$
12. Solve the following pair of linear equations graphically :
 $2x + 3y = 12$ and $x - y = 1$
Find the area of the region bounded by the two lines representing the above equations and y -axis.
13. If 2 is subtracted from the numerator and 1 is added to the denominator, a fraction becomes $\frac{1}{2}$ but when 4 is added to the numerator and 3 is subtracted from the denominator, it becomes $\frac{3}{2}$. Find the fraction.
14. A and B are two points 150 km apart on a highway. Two cars start from A and B at the same time. If they move in the same direction they meet in 15 hours. But if they move in the opposite direction, they meet in 1 hour. Find their speeds.
15. The sum of a two digit number and the number obtained by reversing the order of digits is 165. When 9 is subtracted from the number the digits interchanged their places. Find the number.
16. Solve for x and y by cross multiplication method: $\frac{x}{2a} - \frac{y}{2b} = a + b, \frac{x}{a} + \frac{y}{b} = a - b$.
17. a and b such that $(x + 1)$ and $(x+2)$ are the factors of the polynomials $x^3 + ax^2 - bx + 10$
18. Divide 29 into two parts so that the sum of squares of the parts is 425.
19. Solve the following quadratic equations for x :
 - (i) $9x^2 - 6ax + (a^2 - b^2) = 0$
 - (ii) $\frac{x-1}{x-2} + \frac{x-3}{x-4} = \frac{10}{3}, x \neq 2, x \neq 4$
 - (iii) $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}, x \neq -4, x \neq 7$
 - (iv) $\frac{1}{x+3} + \frac{1}{2x-1} = \frac{11}{7x+9}, x \neq -3, \frac{1}{2}, -\frac{9}{7}$
20. If the equation $(1 + m^2)x^2 + 2mcx + c^2 - a^2 = 0$ has equal roots, show that $c^2 = a^2(1 + m^2)$
21. If one root of the equation $x^2 + 7x + k = 0$ is -2, then find the value of k and the other root.
22. For what value of 'k' the equation $2x^2 + kx + 3 = 0$ has equal roots?
23. Determine 'a' so that $2a+1, a^2+a+1$ and $3a^2-3a+3$ are consecutive terms of an A.P.

24. Determine x so that $\frac{3}{5}$, x and $\frac{5}{3}x$ are in A.P.
25. The sum of 3 numbers in A.P. is -6, and their product is 64. Find the numbers.
26. Find four terms in A.P. whose sum is 16 and sum of their squares is 84.
27. Find the 12th term from end of the A.P. 3,6,9,.....,60.
28. Which term of A.P. : 92, 88, 84, 80, is 0?
29. Which term of A.P. 114, 109, 104,..... Is the first negative term?
30. Which term of A.P. 13, 25, 37, 49,..... will be 372 more than its 26th term?
31. The 7th term of A.P. is -4 and 13th term is -16. Find the A.P.
32. The sum of 4th and 8th term of A.P. is 24 and the sum of 6th and 10th term is 44. Find the first three terms of the A.P.
33. The 9th term of A.P. is equal to 7 times the 3rd term and 13th term exceeds three times the 5th term by 8. Find the 27th term.
34. Divide 54 into 3 parts in A.P. such that 5 times the smallest exceeds the largest by 6.
35. The n^{th} term of an A.P. is $(5n-2)$. Find the A.P.
36. In an orchard there are 17 guava trees in the first row, 15 in the second row, 13 in the third, and so on. There are 3 guava trees in the last row. How many rows are there in the orchard?
37. If the m^{th} term of an A.P. be $\frac{1}{n}$ and n^{th} term be $\frac{1}{m}$, then show that its $(mn)^{\text{th}}$ term is 1.
38. Show that the n^{th} term of an A.P. is $(p+q-n)$, if its p^{th} term is q and q^{th} term is p .
39. Sum of first n terms of an AP is $5n^2 - 3n$. Find the AP and also find its 16th term.
40. Find the number of terms in the sequence $20, 19\frac{1}{3}, 18\frac{2}{3}, \dots$ of which sum is 300. Explain the double answer.