



**SUMMER HOLIDAY HOME-WORK (Class X)**

1. Prove that (i)  $2\sqrt{5} + 4$  (ii)  $\sqrt{5} + \sqrt{3}$  (iii)  $(\sqrt{5} + \sqrt{3})^2$  are irrational.
2. Find the HCF of 52 and 117 and express it in the form  $52x + 117y$ .
3. A circular field has a circumference of 360 km. Three cyclists start together and can cycle 48, 60 and 72 km a day, round the field. When will they meet again?
4. In a seminar the number of participants in mathematics, physics and biology are 336, 240 and 96. Find the minimum number of rooms required if in each room same number of participants is to be seated and all of them being in the same subjects .
5. If  $x$  and  $y$  are odd positive integers then prove that  $x^2 + y^2$  is even but not divisible by 4.
6. If  $\alpha$  and  $\beta$  are the roots of the quadratic polynomial  $p(x) = x^2 - (k + 6)x + 2(2k - 1)$  then find the value of  $k$  if  $\alpha + \beta = \frac{\alpha\beta}{2}$  .
7. Find the zeroes of the polynomial  $p(x) = x^2 + 2\sqrt{2}x - 6$  and verify the relationship between the zeroes and its co-efficient.
8. (i) If two zeroes of the polynomial  $p(x) = x^4 - 6x^3 - 26x^2 + 138x - 35$  are  $2 \pm \sqrt{3}$  find the other zeroes.  
(ii) Find all zeroes of the polynomial  $f(x) = 2x^4 - 2x^3 - 7x^2 + 3x + 6$ , if its two zeroes are  $-\sqrt{3/2}$  and  $\sqrt{3/2}$  .
9. If the polynomial  $6x^4 + 8x^3 + 17x^2 + 21x + 7$  is divisible by another polynomial  $3x^2 + 4x + 1$  , the remainder comes out to be  $ax + b$  , then find  $a$  and  $b$ .
10. What must be added to the polynomial  $p(x) = 5x^4 + 6x^3 - 13x^2 - 44x + 7$  so that the resulting polynomial is exactly divisible by the polynomial  $q(x) = x^2 + 4x + 3$  .
11. Solve: (i)  $\frac{x}{2} + y = 0.8$  ;  $\frac{7}{x + \frac{y}{2}} = 10$ .      (ii)  $7(y+3) - 2(x+2) = 14$  ;  $4(y-2) + 3(x-3) = 2$ .  
(iii)  $3(2u + v) = 7uv$  ;  $3(u + 3v) = 11uv$  .      (iv)  $px + qy = p - q$  ;  $qx - py = p + q$ .
12. (i) Find the values of  $p$  and  $q$  for which the following system of equations has infinite number of solutions.  
 $2x + 3y = 7$  ;  $(p + q)x + (2p - q)y = 21$ .  
(ii) Find the value of  $k$  for which the following system of equations has a unique solution.  
 $x + 2y = 3$  ;  $5x + ky + 7 = 0$ .  
(iii) Find the value of  $k$  for which the following system of equations has no solution.  
 $(3k + 1)x + 3y - 2 = 0$  ;  $(k^2 + 1)x + (k - 2)y - 5 = 0$ .
13. A years ago, age of two brothers were in the ratio of  $2 : 3$ . 6 years hence age of brother will be in the ratio of  $3 : 4$ . Find their present age.
14. A boat covers 32 km upstream and 36 km downstream in 7 hours. Also, it covers 40 km upstream and 48 km downstream in 9 hours. Find the speed of the boat in still water and that of the stream.

15. On selling a TV at 5 % gain and a fridge at 10 % gain, a shopkeeper gains Rs 2000. But if he sells the TV at 10 % gain and the fridge at 5 % loss. He gains Rs 1500 on the transaction. Find the actual prices of TV and fridge.

16. Solve: (i)  $\frac{x+1}{x-1} - \frac{x-1}{x+1} = \frac{5}{6}$  ;  $x \neq 1, -1$       (ii)  $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$       (iii)  $7x + \frac{3}{x} = 35\frac{3}{5}$

17. The sum of two numbers is 6. Find the numbers, if the sum of their reciprocals  $\frac{24}{35}$ .

18. Find three consecutive positive integers whose product is equal to 16 times their sum.

19. A train travel at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average of 6 km/hr more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed.

20. A shopkeeper buys a number of books for Rs 800. If he had bought 4 more books for the same amount, each book would have cost is Rs 10 less. How many book did he buy?

21. Find the value of the middle term of the following AP :  $-6, -2, 2, \dots, 58$ .

22. Interior angles of a polygon are in AP. If the smallest angle is  $120^\circ$  and common difference is  $5^\circ$ , find the number of sides of the polygon.

23. How many numbers lie between 10 and 300, which when divided by 4 leave a remainder 3 ?

24. The sum of n terms of two AP's are in the ratio  $5n + 9 : 9n + 6$ . Find the ratio of their 18<sup>th</sup> term.

25. Deepak repays his total loan of Rs. 118000 by paying every month starting with the first installment of Rs. 1000. If he increase the installment by Rs. 100 every month, what amount will be paid as the last installment of loan ? What amount of loan he still have to pay after the 30<sup>th</sup> installment ?