

## Holiday's Homework, 2019-20

### Class X

### Mathematics

#### **Task – 1**

Complete all the assessments of educosoft.

#### **Task – 2**

Practice the following assignments.

#### Assignment -1

#### Real Numbers

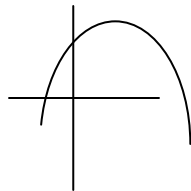
1. LCM of two numbers is 2079 and HCF is 27. If one number is 297, find the other number. (Ans: 189).
2. Explain why  $3 \times 11 \times 17 + 17$  a composite number.
3. Find the LCM and HCF of the pair of integers 120, 70. Also verify that  $\text{LCM} \times \text{HCF} = \text{product of numbers}$ .
4. After how many decimal places the decimal expansion of the rational number  $\frac{11}{2^3 5^2}$  will terminate. (Ans: 3)
5. Check whether  $(15)^n$  can end with the digit 0.
6. Show that any positive odd integer is of the form  $4q+1$  or  $4q+3$ , where  $q$  is an integer.
7. If  $d$  is the HCF of 45 and 27 find  $x$  and  $y$  satisfying  $d=27x+45y$ . (Ans:  $x=2, y=-1$ )
8. Using prime factorization method, find HCF and LCM of 72, 126 and 168. Also show that  $\text{HCF} \times \text{LCM} = \text{product of the three numbers}$ .
9. In a school there are two sections A and B of class X. There are 48, 60 students in two sections respectively. Determine the least number of books required for the library so that the books can be distributed equally among the students. (Ans: 240)
10. Prove that  $5+7\sqrt{3}$  is an irrational number
11. For some integer  $m$ , what is the form of every even integer and odd integer (Ans:  $2m$  and  $2m+1$ )
12. If two positive integers  $p$  and  $q$  can be expressed as  $p = ab^2$  and  $q = a^3b$ ;  $a, b$  being prime numbers, Find the LCM ( $p, q$ ). (Ans:  $a^3b^2$ )

13. Using Euclid's division algorithm, find which of the following pairs of numbers are co-prime: (i) 231, 396 (ii) 847, 2160
14. Show that the square of an odd positive integer is of the form  $8m + 1$ , for some whole number  $m$ .
15. Show that the square of any positive integer cannot be of the form  $5q + 2$  or  $5q + 3$  for any integer  $q$ .

### Assignment-2

#### Polynomials

1.  $\alpha$  and  $\beta$  are the zeros of the polynomial  $2x^2 + 3x + 4$  find the value of (i)  $1/\alpha^2 + 1/\beta^2$  (ii)  $\alpha + \beta + \alpha\beta$
2. Find all other zeros of the polynomial  $x^4 + x^3 - 9x^2 - 3x + 18$  if it is given that two of the zeros are  $-\sqrt{3}$  and  $\sqrt{3}$
3. What must be added to the polynomial  $5x^4 + 6x^3 - 13x^2 - 44x + 7$  so that the resulting polynomial is divisible by  $x^2 + 4x + 3$ .
4. If the sum of the squares of zeros of the polynomial  $6x^2 + x + k$  is  $25/36$ , find the value of  $k$
5. If  $\alpha$  and  $\beta$  are the zeros of the polynomial  $x^2 - 3x + 7$ , find a quadratic polynomial whose zeros are  $1/\alpha$  and  $1/\beta$
6. Find the zeros and verify the relation between zeros and coefficients of (i)  $x^2 + 11x + 30$  (ii)  $x^2 - 9$
7. Find the number of zeros of  $p(x)$  in figure



8. Find a quadratic polynomial whose sum and product of zeros are  $1/3$  and  $-1/3$
9. Divide  $3x^2 - x^3 - 3x + 5$  by  $x - 1 - x^2$  and verify the division algorithm
10. On dividing  $2x^3 + 4x^2 + 5x + 7$  by  $g(x)$  the quotient and remainder are  $2x$  and  $7 - 5x$  respectively. Find  $g(x)$
11. Find the zeroes of  $\sqrt{3}x^2 + 10x + 7\sqrt{3}$
12. If the sum of the zeroes of the quadratic polynomial  $ky^2 + 2y - 3k$  is equal to twice their product, find the value of  $k$ .
13. If  $\alpha$  and  $\beta$  are the zeroes of quadratic polynomial  $2x^2 + 5x + k$ , find the value of  $k$  such that  $(\alpha + \beta)^2 - \alpha\beta = 24$ .
14. If one zero of the polynomial  $(k + 1)x^2 - 5x + 5$  is the multiplicative inverse of the other, then find the zeroes of  $kx^2 - 3kx + 9$ , where  $k$  is a constant.

15. If  $\alpha$  and  $\beta$  are the zeroes of the polynomial  $x^2 + 6x + 9$ , then form a polynomial whose zeroes are  $-\alpha$  and  $-\beta$ .
16. If one zero of the quadratic polynomial  $4x^2 - 8kx + 8x - 9$  is negative of the other, then find the zeroes of  $kx^2 + 3kx + 2$ .
17. If 2 and 3 are zeroes of the polynomial  $3x^2 - 2kx + 2m$ , find the values of  $k$  and  $m$ .

### Assignment-3

#### Pair of linear equations in two variables

1. For what value of  $k$  the eq.  $kx + 3y - (k - 3) = 0$  and  $12x + ky - k$  have infinite many solution
2. Check whether  $7x + 3y = 27$  and  $2x + 5y = 16$  have unique solution, no solution or infinite many solution.
3. Find  $k$  if  $kx + 3y + 1 = 0$  and  $2x + y + 3 = 0$  has unique solution.
4. Check whether  $5x - 3y = 11$  and  $-10x + 6y = -22$  represent an intersecting lines, parallel lines or coincident lines.
5. Solve:  $2/x + 2/3y = 1/6$  and  $3/x + 2/y = 0$
6. Solve graphically  $x - y + 1 = 0$  and  $3x + 2y - 12 = 0$
7. Solve  $6x + 3y = 6xy$  and  $2x + 4y = 5xy$
8. Draw the graph of the following:  $3x + y + 1 = 0$  and  $2x - 3y + 8 = 0$  Also find the area bounded by these lines and  $y=0$ .
9. For what values of  $a$  and  $b$  the following system of equations have infinite many solutions:  $3x - (a + 1)y = 2b - 1$  and  $5x + (1 - 2a)y = 3b$
10. Solve :  $\frac{2}{x+2y} + \frac{1}{2x-y} + \frac{5}{9} = 0$ ;  $\frac{9}{x+2y} + \frac{6}{2x-y} + 4 = 0$
11. A two digit number can be obtained either multiplying the sum of the digits by 8 or multiplying the difference of the digits by 14 and adding 2. Find the number.
12. A small scale industry produces certain number of items per day. The cost of production of each item was calculated to be 74 minus twice the number of articles produced in a day. On a particular day the total cost of production was Rs. 540. Find the number of articles produced.
13. Raman has two daughters Deepa and Anju. Present age of Raman is nine more than that of twice the sum of Deepa and Anju. Five years hence, the age of Raman will be 4 more than one and half times the sum of the ages of Deepa and Anju. Determine the age of Raman
14. Solve :  $bx/a - ay/b + a + b = 0$  and  $bx - ay + 2ab = 0$
15. Raghu and Mohan together finish a work in 15 days. When they work separately, Raghu takes 16 days less than the number of days taken by

Mohan to finish the same work. Find the number of days taken by Mohan to finish the work.

### Assignment-4

#### Trigonometry

- If  $\sin 3\theta = \cos (\theta - 12^\circ)$  here  $3\theta$  and  $(\theta - 12^\circ)$  are acute angles, find the value of  $\theta$ .
- Find the value of  $\sin 30^\circ$  and  $\cos 30^\circ$  geometrically.
- Prove that :  $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$
- Evaluate :  $4(\sin^4 30^\circ + \cos^4 60^\circ) - 3(\cos^2 45^\circ - \sin^2 90^\circ) + (\sin^2 60^\circ + \sin^2 45^\circ)$
- If  $\sin \theta + \cos \theta = \sqrt{2} \cos \theta$ , show that  $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$
- If  $\tan A = \frac{1}{2}$ , then prove that  $\frac{1}{2} \sin A \cos A = \frac{1}{5}$
- If  $\sin(A + B) = \frac{\sqrt{3}}{2}$  and  $\cos(A - B) = 1$ . find A and B
- Evaluate:  $\tan^2 60^\circ + 4 \cos^2 45^\circ + 3 \sec^2 30^\circ + 5 \cos^2 90^\circ$

$$\frac{\operatorname{Cosec} 30^\circ + \sec 60^\circ - \cot^2 30^\circ}{}$$

- If  $\sin \theta + \cos \theta = \sqrt{3}$ , then prove that  $\tan \theta + \cot \theta = 1$
- Evaluate: (i)  $\sin^2 39^\circ + \sin^2 51^\circ + \sec^2 27^\circ - \cot^2 63^\circ + \tan 5^\circ \tan 25^\circ \tan 45^\circ \tan 65^\circ \tan 85^\circ$
- If  $x = a \sec \theta$ ,  $y = b \tan \theta$ , prove that  $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$
- If  $3x = \operatorname{cosec} \theta$  and  $\frac{3}{x} = \cot \theta$ , find the value of  $3(x^2 - \frac{1}{x^2})$
- If  $\sin \theta + \cos \theta = p$  and  $\sec \theta + \operatorname{cosec} \theta = q$ , show that  $q(p^2 - 1) = 2p$
- Find the value of the given expression:

$$\frac{\sin(90^\circ - \theta) \operatorname{cosec} \theta - \tan(90^\circ - \theta) \cot \theta + \cos^2 25^\circ + \cos^2 65^\circ}{}$$

- Prove that  $\left(\frac{1 + \sin \theta - \cos \theta}{1 + \sin \theta + \cos \theta}\right)^2 = \frac{3 \tan 27^\circ \cdot \tan 63^\circ}{1 - \cos \theta}$

### Assignment-5

#### Statistics

- Find the mean, median and mode of the following data:

Class interval	0-20	20-40	40-60	60-80	80-100
Frequency	5	10	20	12	3

- If the median of the following data is 27, find the values of x and y

C. I.	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	Total
f	5	x	20	14	y	8	68

3. What is the empirical relation between mean, median and mode.  
 4. If mean of distribution is 5.26 and median is 5.47. Find the mode.

6. The mean of the following distribution is 62.8 find the missing frequency  $F_1$  and  $F_2$

Class Interval	0-20	20-40	40-60	60-80	80-100	100 - 120
Frequency	5	$F_1$	10	$F_2$	7	8

7. Find the median of the following table:

Class	100 - 120	120 - 140	140 - 160	160 - 180	180 - 200
frequency	12	14	8	6	10

8. Draw 'less than' ogive curve for the following distribution:

Class interval	20 - 30	30 - 40	40 - 50	50 - 60	60 70	70 - 80	80 - 90
frequency	10	8	12	24	6	25	15

9. Find the mode of the following table shows the ages of the patients admitted in a hospital during a year:

Age (in years)	5 - 15	15 - 25	25 - 35	35 - 45	45 - 55	55 - 65
No. of Patients	6	11	21	23	14	5

10. Draw 'more than' ogive curve for the following distribution:

Class interval	20 - 30	30 - 40	40 - 50	50 - 60	60 70	70 - 80	80 - 90
frequency	10	8	12	24	6	25	15