

**SUMMATIVE ASSESSMENT - I, 2014  
MATHEMATICS (SET-A)**

**Class - X**

Time Allowed: 3 hours

Maximum Marks: 90

**General Instructions:**

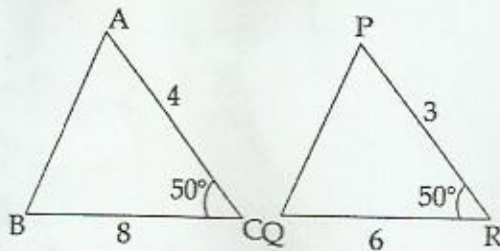
1. All questions are compulsory.
2. The question paper consists of 31 questions divided into four sections A, B, C and D. Section-A comprises of 4 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each; Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 11 questions of 4 marks each.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

**SECTION-A**

Question numbers 1 to 4 carry one mark each

1

In the given figure, the two triangles are similar. Write the similarity criterion used and pair of similar triangles in the symbolic form.



2

Find the value of  $\frac{\tan 30^\circ \tan 60^\circ}{\tan 45^\circ}$

1

3

Evaluate :  $\sin 30^\circ - \cos 60^\circ$

1

4

From the following cumulative frequency table, write the frequency of the class interval 30-40. 1

Marks	Number of students
Less than 10	2
Less than 20	15
Less than 30	40
Less than 40	71
Less than 50	85

## SECTION-B

Question numbers 5 to 10 carry two marks each.

5

Is  $2.\overline{134}$  a rational number or an irrational number? What can you say about prime factorisation of its denominator? 2

6

Find HCF of the number 31, 310 and 3100. 2

7

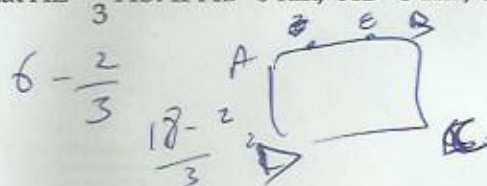
Solve the following pair of linear equations: 2

$$x + 2y = 23$$

$$4x - 3y = 10$$

8

In a rectangle ABCD, E is a point on AB such that  $AE = \frac{2}{3}AB$ . If  $AB = 6$  km,  $AD = 3$  km, then find AE. 2



9

Express  $\cos A$  in terms of  $\cot A$ . 2

10

The following table gives the literacy rate (in %) of 25 cities. Find the median class and modal class. 2

Literacy rate in percent	50 - 60	60 - 70	70 - 80	80 - 90
Number of cities	9	6	8	2



SECTION-C

Question numbers 11 to 20 carry three marks each.

11 An army contingent of 678 soldiers is to march behind an army band of 36 members in a Republic Day parade. The two groups are to march in the same number of columns. What is the maximum number of columns they can march ? 3

12 Find a quadratic polynomial, the sum and product of whose zeroes are 21 and 220 respectively. Hence find the zeroes. 3

13 Solve for  $x$  and  $y$  : 3

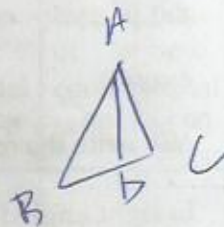
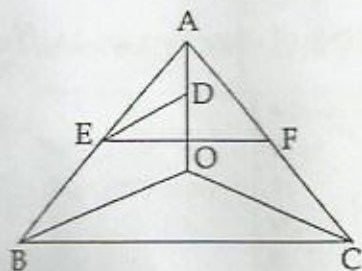
$$2x=5y+4$$

$$3x-2y+16=0$$

14 Find those integral values of  $m$  for which the  $x$ -coordinate of the point of intersection of lines represented by  $y=mx+1$  and  $3x+4y=9$  is an integer. 3

15 If in equilateral  $\triangle ABC$ ,  $AD \perp BC$ , then prove that  $AD^2=3BD^2$  3

16 In the figure if  $DE \parallel OB$  and  $EF \parallel BC$ , then prove that  $DF \parallel OC$ . 3



17 Prove that :  $\frac{\sin u + \cos u}{\sin u - \cos u} + \frac{\sin u - \cos u}{\sin u + \cos u} = \frac{2 \sec^2 u}{\tan^2 u - 1}$  3

18 If  $\sin u = \frac{12}{13}$ , then find the value of :  $\frac{2 \sin u - 3 \cos u}{4 \sin u - 9 \cos u}$  3

19 The mean of the following distribution is 31.4. Determine the value of the missing frequency  $x$ . 3

Class	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	$x$	10	12	7	8

20

Weights of students of class X are given in the following frequency distribution :

Weight (in kg)	40-44	44-48	48-52	52-56	56-60	60-64
Number of students	9	10	15	8	7	1

Find the modal weight.

## SECTION-D

Question numbers 21 to 31 carry four marks each.

21

Jenny and Sally bought a special 360 day joint membership of a tennis club. Jenny will use the club every alternate day and Sally will use the club every third day. They both use the club on the first day. How many days will neither person use the club in the 360 days?

22

An old person decided to donate most of property and assets before his death to different orphanage for the well-being of the children living there. His total property is represented by  $2x^4 + 3x^3 - 4x^2 + ax - b$  and the number of orphanages contacted is given by  $2x^2 - 3x + 1$ . The left over amount he kept for his remaining life is given by  $2x - 5$ . Find the value of a and b.

23

What is the inspiration of old man?

24

Obtain all other zeroes of the polynomial  $x^4 - 4x^2 - 4x - 1$ , if two of its zeroes are  $1 + \sqrt{2}$  and  $1 - \sqrt{2}$ .

Draw graph of following pair of linear equations :

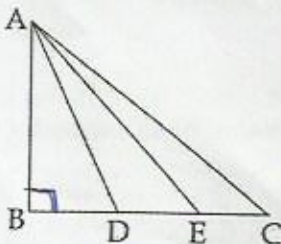
$$Y = 2(x - 1)$$

$$4x + y = 4$$

Also write the coordinates of the points where these lines meet x-axis and y-axis.

25

In right angled  $\triangle ABC$  if D and E trisect BC, then prove that  $8 AE^2 = 3 AC^2 + 5 AD^2$ .

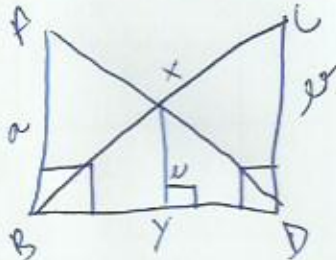
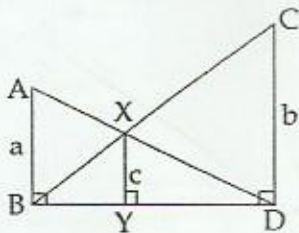




26

In the figure  $\angle ABD = \angle XYD = \angle CDB = 90^\circ$ ,  $AB = a$ ,  $XY = c$  and  $CD = b$ , then prove that  $c(a+b) = ab$ .

4



27

Prove that :

4

$$(\operatorname{cosec} \theta + \cot \theta)^2 = \frac{\sec \theta + 1}{\sec \theta - 1}$$

28

In a circle of radius 8 cm, an equilateral triangle is inscribed. Find the side of the triangle.

4

29

Prove that :

4

$$(\sin u + \cos u + 1) \cdot (\sin u - 1 + \cos u) \cdot \sec u \cdot \operatorname{cosec} u = 2$$

30

Given below are ages of 100 people in a locality :

4

Age (in years)	More than or equal to 10	More than or equal to 20	More than or equal to 30	More than or equal to 40	More than or equal to 50	More than or equal to 60	More than or equal to 70	More than or equal to 80	More than or equal to 90
Number of people	100	91	80	63	37	24	16	5	1

Draw a 'more than type' ogive. From the ogive, find median and verify it by actual calculations.

31

The table given below shows the weekly expenditures on food of some households in a locality :

Weekly expenditure (in ₹)	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900
Number of households	5	6	11	13	5	4	3	2

Draw a 'less than type' ogive and a 'more than type' ogive for this distribution.