SUMMATIVE ASSESSMENT 1
MATHEMATICS
Class – X

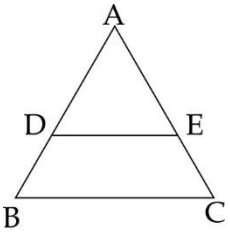
Time Allowed: 3 hours **Maximum Marks: 90**

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, if DE ?? BC, AE58 cm, EC52 cm and BC56 cm, then find DE. 	1
2	If cotA52, then find the value of cosec^2A1$\cot^2$A	1
3	Find the value of $\sin^2$υ1 $\frac{1}{11\ \tan^2 u}$	1
4	If the mode of the data : 3, 5, 8, 9, 8, 12, 7, 12 and x is 8, find the value of x.	1

SECTION-B

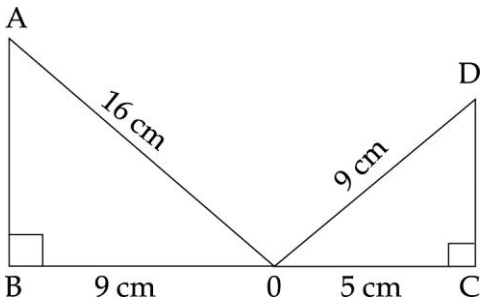
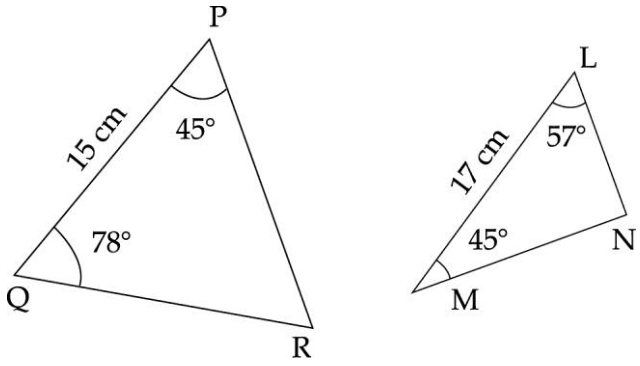
Question numbers **5** to **10** carry two marks each.

5	Use Euclid's division algorithm to find HCF of 450 and 125.	2
6	Show that $2\sqrt{5}$ is an irrational number	2
7	A lending library has a fixed charge for the first two days and an additional charge for each day thereafter. Abdul paid ` 30 for a book kept for 6 days while Kaira paid ` 45 for a book kept for 9 days. Find the fixed charge and the charge for each extra day.	2
8	A ladder is placed against a wall such that its foot is at a distance of 5 m from the wall and its top reaches a window $5\sqrt{3}$ m above the ground. Find the length of the ladder.	2
9	Prove that : (cosecυ2sinυ) (secυ2cosυ)5cosυ. sinυ	2
10	Data regarding weights of students of Class X of a school is given below. Calculate the average (mean) weight of the students.	2

Weight (in kg)	50-52	52-54	54-56	56-58	58-60	60-62	62-64
Number of students	18	21	17	28	16	35	15

SECTION-C

Question numbers **11** to **20** carry three marks each.

11	Three bells toll at intervals of 12 minutes, 15 minutes and 18 minutes respectively. If they start tolling together, after what time will they next toll together ?	3
12	Solve for x and y : $\frac{5}{x\,2\,\,1}\,1\,\,\frac{1}{y\,2\,\,2}\,5\,\,2;\,\frac{6}{x\,2\,\,1}\,2\,\,\frac{3}{y\,2\,\,2}\,51$	3
13	Find a quadratic polynomial, the sum and product of whose zeroes are 0 and $2\,\frac{3}{5}$ respectively. Hence find the zeroes.	3
14	In a right angled triangle one acute angle is double the other. Find the acute angles.	3
15	In a right angled ΔABC, $\angle B5908$. If $\frac{AB}{AC}\,5\,\frac{1}{\sqrt{2}}$, find $\frac{BC}{AC}$.	3
16	State whether the given pairs of triangles are similar or not. In case of similarity mention the criterion. (a)  (b)  	3
17	If $\cos(A2B)5\cos A\,\cos B1\sin A\,\sin B$, evaluate $\cos 158$	3
18	Prove that : $\frac{\tan u}{\sec u\,2\,\,1}\,1\,\,\frac{\tan u}{\sec u\,1\,\,1}\,5\,\,2\,\mathrm{cosec}\,u$	3
19	A survey was conducted in Railways regarding the life insurance policies taken by the employees. Data obtained is as follows :	3

Age of policy	20-24	24-28	28-32	32-36	36-40	40-44	44-48

	holder (in years)							
	Number of policy holders	3	10	25	31	19	12	6

Draw a 'less than type' ogive.

20 In a hospital, weights of new born babies were recorded, for one month. Data is as shown : 3

Weight of new born baby (in kg)	1.4 – 1.8	1.8 – 2.2	2.2 – 2.6	2.6 – 3.0
Number of babies	3	15	6	1

Find the median weight.

SECTION-D

Question numbers **21** to **31** carry four marks each.

21 If two positive integers x and y are expressible in terms of primes as $x5p^2q^3$ and $y5p^3q$, what can you say about their LCM and HCF. Is LCM a multiple of HCF ? Explain. 4

22 4 chairs and 3 tables cost ` 2100 and 5 chairs and 2 tables cost ` 1750. Find the cost of one chair and one table separately. 4

23 Divide the polynomial $x^4217x^2134x212$ by $x22$ and find quotient and remainder. Also verify the division algorithm. 4

24 A NGO decided to distribute books and pencils to the students of a school running by some other NGO. For this they collected some amount from different number of people. The total amount collected is represented by $4x^412x^328x^213x27$. The amount is equally divided between each of the students. The number of students, who received the amount is represented by $x2212x^2$. After distribution, $5x211$, amount is left with the NGO which they donated to school for their infrastructure. Find the amount received by each student from the NGO.
What value have been depicted here ? 4

25 State and prove converse of Pythagoras theorem.
Using the above theorem, solve the following : In ΔABC, $AB56\sqrt{3}$ cm, BC56 cm and AC512 cm, find $\angle B$. 4

26 If in ΔABC, AD is median and $AM \perp BC$, then prove that $AC^25AD^21BC3DM1 \frac{1}{4}BC^2$. 4

27 Evaluate : 4
$\tan^2 308.\ \sin 308\ 1\ \cos 608.\ \sin^2 908.\ \tan^2 608\ 2\ 2\ \tan 458.\ \cos^2 08.\ \sin 908$

28 Prove that : 4
$(\tan\upsilon + \sec\upsilon - 1).\ (\tan\upsilon + 1 + \sec\upsilon)\ 5\ \frac{2\ \sin u}{1\,2\ \ \sin u}$

29 If l $\operatorname{cosec}\upsilon\ 1\ m\ \cot\upsilon\ 1\ n\ 5\ 0$ and $l'\ \operatorname{cosec}\upsilon\ 1\ m'\ \cot\upsilon\ 1\ n'\ 5\ 0$, show that $(mn'\ 2\ m'n)^2\ 2\ (n\ l'\ 2\ n'\ l)^2\ 5\ (l\ m'\ 2\ l'm)^2$ 4

30 Following distribution gives the marks obtained, out of 200, by the students of Class IX in their class test : 4

Marks	0-25	25-50	50-75	75-100	100-125	125-150	150-175	175-200
Number of students	10	15	□22	30	28	27	12	6

Find the mean and mode of the data.

31 The literacy rate of females in 50 cities is given in the frequency distribution : 4

Literacy rate (in %)	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Number of cities	3	2	6	15	8	7	5	4

Find the mode and median of this data.

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