

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 in to four sections A,B,C and D
3. section -A comprises of 4 questions of 1 mark each,
Section -B comprises of 4 questions of 2 mark each.
Section -c comprises of 4 questions of 3 mark each
Section -D comprises of 4 questions of 4 mark each
4. use of calculator is not permitted.
5. An additional 15 minuts time has been allotted to read this question paper only.

SECTION A

Directions: 4 question of 1 mark each

1. Find a quadratic polynomial having zeroes as $\frac{-3}{\alpha}$ and $\frac{2}{\alpha}$
2. Write the formula for the mid-point of a class interval .
3. If $\sin A = \frac{3}{4} \sqrt{5}$, calculate $\cos A$
4. Given an example of a pair of similar fugures.

SECTION-B

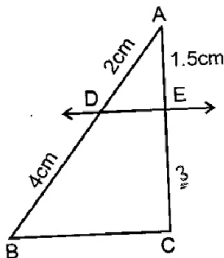
Directions: 6 questions of 2marks each.

5. Find the zeroes of $t^2 - 15$ and verify the relationship between the zeroes and Coefficients
6. Determine whether the following system of linear equation has a unique solution, no solution or infinitely many solution.

$$4x - 5y = 3$$

$$8x - 10y = 6$$

7. In the given figure $DE \parallel BC$. Find Ec



8. $\sin 2A = 2 \sin A$ is true when $A = ?$

- (a) 0°
- (b) 30°
- (c) 45°
- (d) 60°

9. Express $\sin 67^\circ + \cos 75^\circ$ in terms of trigonometric ratios of angles between 0° and 45°

10. Find mode of the given distribution

Family size	1-3	3-5	5-7	7-9	9-11
No. of families	7	8	2	2	1

Or

The following table gives the literacy rates (in percentage) of 35 cities. Find the mean literacy rate.

Literacy rate (in %)	number of cities
45-55	3
55-65	10
65-75	11
75-85	8
85-95	3

SECTION -C

Directions: 10 QUESTIONS OF 3MARKS EACH

11. Prove that $\sqrt{5}$ is an irrational number.

12. If α and β are the zeroes of the polynomial $x^2 - 5x + k$ and $\alpha - \beta = -1$.

Find the value of k .

13. Determine a and b for which the following system of linear equations has infinitely many solutions

$$2x - (a-4)y = 2b+1$$

$$4x - (a-1)y + 5b - 1$$

14. If the areas of two similar triangles are equal, Prove that they are congruent.

15. PQR is a right angled triangle right angled at P . M is a point on QR such that $PM \perp QR$. Show that

$$PM^2 = QM \cdot MR$$

16. Prove that:

$$\sqrt{\frac{\sec \theta - 1}{\sec \theta + 1}} + \sqrt{\frac{\sec \theta + 1}{\sec \theta - 1}} = 2 \operatorname{cosec} \theta$$

17. If $\tan A = \cot B$,

Prove that $A + B = 90^\circ$

If A,B,C are interior angles of a ΔABC , show that

$$\sec^2 \left(\frac{B+C}{2} \right) - 1 = \cot^2 \left(\frac{A}{2} \right)$$

18. Evaluate :

$$5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ$$

$$\sin^2 30^\circ + \cos^2 30^\circ$$

19. The length of 40 leaves of a plant are measured correct to nearest millimeter and the data obtained is represented in the table below:

Find the median length of the leaves

Length (in mm)	no. of leaves
118-126	3
127-135	5
136-144	9
145-153	12
154-162	5
163-171	4
172-180	2

20. The following distribution gives the daily income of 50 workers of a factory

Daily income (in Rs)	No. of workers
100-120	12
120-140	14
140-160	8
160-180	6
180-200	10

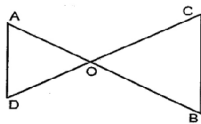
Convert the distribution above a less than type cumulative frequency distribution and draw its ogive.

SECTION -D

Directions: 11 question of 4 marks each

21. (a) Find the HCF of 1305, 1365 by using Euclid's division algorithm.
(b) Also deduce the LCM of 1305 and 1365.

22. Prove that $2\sqrt{3} + \sqrt{5}$ is an irrational number.
23. Solve graphically the following system of equations:
 $X+2y=5$
 $2x+3y=4$
24. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks for each incorrect answer, then Yash would have scored 40 marks. How many questions were there in the test?
25. Solve the following by substitution method:
 $3x+4y=10$
 $2x-2y=2$
26. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio.
27. In the given figure,
 $OA \cdot OB = OC \cdot OD$
 Show that $\angle A = \angle C$ and $\angle B = \angle D$



Or

If AD and PM are medians of triangles ABC and PQR, respectively where $\triangle ABC \sim \triangle PQR$,

Prove that $\frac{AB}{PQ} = \frac{AD}{PM}$

28. If $\sec \theta + \tan \theta = p$ Show that $\frac{p^2 - 1}{p^2 + 1} = \sin \theta$

29. If $\tan \theta + \sin \theta = m$, and $\tan \theta - \sin \theta = n$. Show that $m^2 - n^2 = 4\sqrt{mn}$

30. The annual profits earned by 30 shops of shopping complex in a locality give rise to the following distribution:

Profit in lakhs (RS)	no. of shops (frequency)
More than or equal to 5	30
More than or equal to 10	28
More than or equal to 15	16
More than or equal to 20	14
More than or equal to 25	10
More than or equal to 30	7

More than or equal to 35	3
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Draw both ogives for the above data and hence obtain the media profit.

31. If the median of the distribution given below is 28.5, find the value of x and y

Class Interval	Frequency
0-10	5
10-20	x
20-30	20
30-40	15
40-50	y
50-60	5
Total	60

