

SATODAY
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SUMMATIVE ASSESSMENT-I, 2015
MATHEMATICS
CLASS-X

Time Allowed : 3 hours

Maximum Marks: 90

General Instructions:

All questions are compulsory.

The question paper consists of 31 questions divided into four sections A, B, C and D. Section-A comprises of 4 multiple choice 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.

There is no overall choice in this question paper.

Use of calculator is not permitted.

SECTION-A

Question numbers 1 to 4 carries 1 mark each.

1. Sides of two similar triangles are in the ratio 4 : 9 . Areas of these triangles are in the ratio
(A) 2 : 3 (B) 4 : 9 (C) 81 : 16 (D) 16 : 81

2. Class mark for the class interval 10 – 35 is
(A) 25 (B) 22.5 (C) 17.5 (D) 45

3. $3 + 2\sqrt{5}$ is
(A) irrational number (B) rational number
(C) whole number (D) natural number

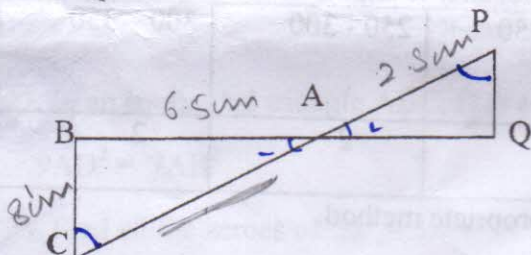
4. Mode is the observation which has:
(A) mean frequency (B) middle most frequency
(C) maximum frequency (D) minimum frequency

SECTION - B

Question numbers 5 to 10 carry 2 marks each.

5. Find HCF of 272 and 148 by Euclid's division algorithm.

6. In the figure, $\triangle ABC \sim \triangle APQ$. If $BC = 8$ cm, $PQ = 4$ cm, $BA = 6.5$ cm, $AP = 2.8$ cm, find CA and AQ .



7. If $\sec A = 13/12$, then find $\cot A$.
8. Find the zeroes of the quadratic polynomial $4u^2 + 8u$ and verify the relationship between the zeroes and the coefficients
9. Show that any positive odd integer is of the form $6q + 1$, or $6q + 3$, $6q + 5$, where q is some integer.
10. If $\cos(\theta - 26^\circ) = \sin 3\theta$, where $(\theta - 26^\circ)$ and 3θ are acute angles, then find the value of θ .

SECTION - C

Question numbers 11 to 20 carry 3 marks each.

11. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.

12. In $\triangle OPQ$, right angled at P, $OP = 7\text{cm}$ and $OQ - PQ = 1\text{cm}$. Determine the values of $\sin Q$ and $\cos Q$.

13. If $\sqrt{3}$ is irrational, show that $5 - \sqrt{3}$ is also irrational.

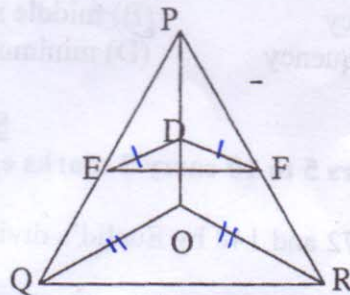
14. Evaluate the following: $\frac{\sin 30^\circ + \tan 45^\circ - \operatorname{cosec} 60^\circ}{\sec 30^\circ + \cos 60^\circ + \cot 45^\circ}$

15. For what value of a and b does the following pair of linear equations have an infinite number of solutions. $2x + 3y = 7$, $(a - b)x + (a + b)y = 3a + b - 2$

16. Divide the polynomial $p(x)$ by polynomial $g(x)$ and find the quotient and remainder.
 $p(x) = x^4 - 3x^2 + 4x + 5$, $g(x) = x^2 - x + 1$

17. In the figure $DE \parallel OQ$ and $DF \parallel OR$.

Prove that $EF \parallel QR$.



18. The daily expenditure on food of 25 households in a locality is shown below..

Daily expenditure (in Rs.)	100 - 150	150 - 200	200 - 250	250 - 300	300 - 350
Number of households	4	5	12	2	2

Find the mean daily expenditure on food by using an appropriate method.

19. Find LCM and HCF of 336 and 54 and verify that LCM \times HCF = product of the two numbers.

20. Solve the pair of linear equations for x and y:

$$\frac{5}{x-1} + \frac{1}{y-2} = 2 \quad ; \quad \frac{6}{x-1} - \frac{3}{y-2} = 1$$

SECTION - D

Question numbers 21 to 31 carry 4 marks each.

21. Solve the following pair of linear equations graphically $x - 2y = 0$, $3x + 4y = 20$

Also, find the area of the triangle formed by the lines representing the given equations with y-axis.

22. A fraction becomes $\frac{9}{11}$, if 2 is added to both the numerator and the denominator. If, 3 is added to

both the numerator and the denominator it becomes $\frac{5}{6}$. Find the fraction.

23. If the median of the following data is 16, find the value of x and y if the total frequency is 70.

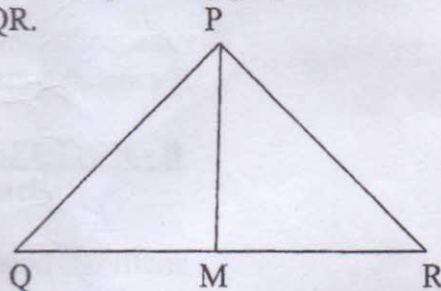
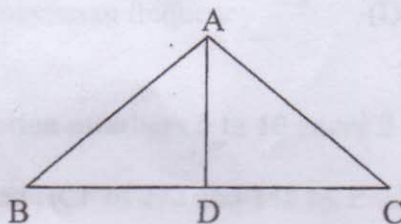
Class interval	Frequency
0 - 5	12
5 - 10	X
10 - 15	12
15 - 20	15
20 - 25	y
25 - 30	8
30 - 35	8

cf
12
12+x
24+x
39+x
39+x+y
47+x+y
55+x+y

39
7
8
54

24. Prove the following identity: $\frac{\tan\theta}{1 - \cot\theta} + \frac{\cot\theta}{1 - \tan\theta} = 1 + \sec\theta \operatorname{cosec}\theta$

25. Sides AB and BC and median AD of ΔABC are respectively proportional to sides PQ and QR and median PM of ΔPQR . Show that $\Delta ABC \sim \Delta PQR$.



26. If $\tan A = \sqrt{3} - 1$, evaluate $\frac{\tan A}{1 + \tan^2 A}$

27. In an equilateral triangle ABC, D is a point on BC such that $BD = \frac{1}{3} BC$. Prove that $9AD^2 = 7AB^2$

28. Find all the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

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

Expenses(in Rs.)	No. of students
5 - 10	2
10 - 15	12
15 - 20	2
20 - 25	4
25 - 30	3
30 - 35	4
35 - 40	3

Draw a 'less than type' and 'more than type' ogives for the given data. Hence obtain the median from the graph.

30. If $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = 1/\sqrt{3}$, $0^\circ < A+B \leq 90^\circ$, $A > B$, find angles A and B.

31. The runs made by players in some cricket matches are tabulated below:

Runs made	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	100 - 120
No. of players	6	8	f1	12	6	5

If mode of the above frequency distribution is 65, find the value of f1.

What is your impression about the players whose performance is given in the table? To discourage your students watching TV for hours together, will you encourage them to play games? Why?

x

