

Cbse Class 10 Mathematics



Previous Year Question
Paper 2005-2015

SUMMATIVE ASSESSMENT- I 2015-16
Class – X MATHEMATICS

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. Section-A comprises of 4 questions of 1 mark each; section-B comprise of 6 questions of 2 marks each; sections-C comprise 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.
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Section-A

Question number 1 to 4 carry one mark each

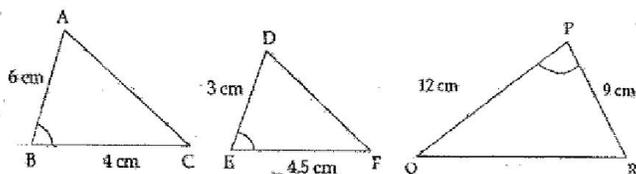
1. In $\triangle PQR$, S and T are points in the sides PQ and PR respectively such that $ST \parallel QR$. If $PS = 4$ cm, $PQ = 9$ cm and $PR = 4.5$ cm, then find PT .
2. Find the value of $\cos \theta + \sec \theta$, when it is given that $\cos \theta = \frac{1}{2}$
3. If $\sqrt{3} \sin \theta$, find the value of $\frac{\sin \theta \cdot \tan \theta \cdot (1 + \cot \theta)}{\sin \theta + \cos \theta}$.
4. Find the sum of upper limit and lower limit of the class interval in which the 20th observation of the following data lies:

Class interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700
Frequency	5	7	6	3	20	4	8

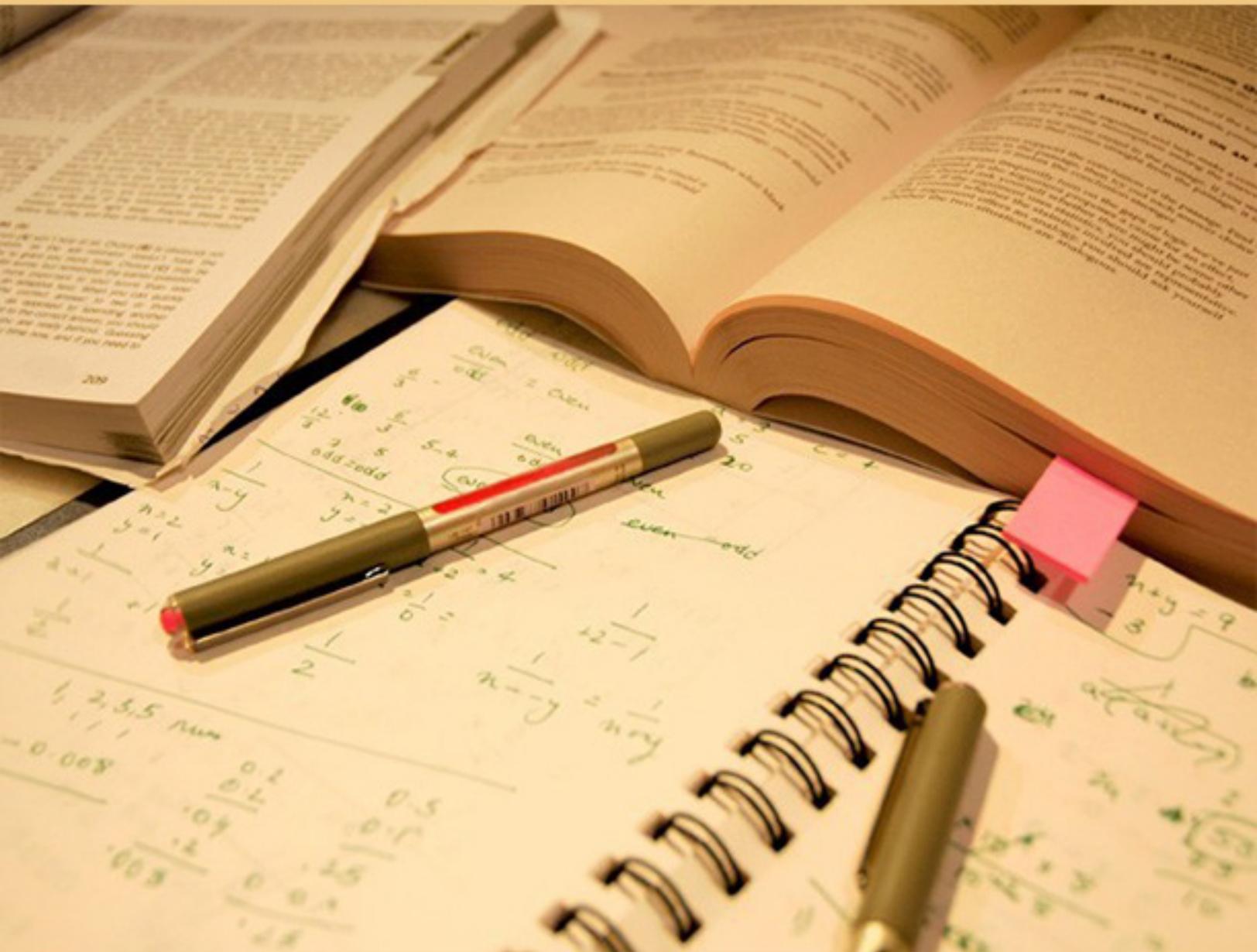
SECTION-B

Question number 5 to 10 carry two marks each.

5. Find the prime factorization of the denominator of the rational number equivalent to $8.\overline{39}$. 2
6. Show that $5\sqrt{6}$ is an irrational number 2
7. Find the quadratic polynomial whose zeroes are $\sqrt{2} + 3$ and $\sqrt{2} - 3$. 2
8. State which of the two triangles given in the figure are similar. Also state the similarity criterion used.



Cbse Class 10 Mathematics



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9. Prove that: $\frac{1}{\tan + \cot \theta} + \frac{1}{1 + \sin A} + \frac{1}{1 - \sin A} = 2 \sec^2 A$

10. Determine missing frequency x , from the following data, when Mode is 67.

Class	40-50	50-60	60-70	70-80	80-90
Frequency	5	X	15	12	7

Questions number 11 to 20 carry three marks each.

11. Use Euclid division lemma to show that square of any positive integer cannot be of the form $5m+2$ or $5m+3$ for some integer m .

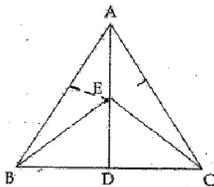
12. A man has certain notes of denomination 20 and 5 which amount to 380. If the number of notes of each kind are interchanged, they amount to 60 less than before. Find the number of notes of each denomination.

13. Divide the polynomial $3x^4 - 5x^3 + 4x^2 + 10x - 2$ by the polynomial $x^3 - 2x$ and verify the division algorithm.

14. Show graphically the following pair of linear equations if inconsistent: 3
 $2x - 2y - 2 = 0$
 $3x - 3y + 5 = 0$

15. $\triangle ABC$ and $\triangle EBC$ are in the same base BC . If AE produced intersects BC at D then, prove that

$$\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle EBC)} = \frac{AD}{ED}$$



16. In a $\triangle ABC$, AD is perpendicular to BC and $AD^2 = BD \times CD$, Prove that ABC is a right angled Triangle.

17.
$$\frac{\sec \theta \sec(90^\circ - \theta) - \tan \theta, \cot(90^\circ - \theta) + \sin^2 55^\circ + \sin^2 35^\circ}{\tan 10^\circ \cdot \tan 20^\circ \cdot \tan 60^\circ, \tan 70^\circ \tan 80^\circ}$$

18. Prove that:

$$(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$$

19. The following data gives the information on the observed life times (in hours) of 150 electrical components:

Life time (in hours)	0-20	20-40	40-60	60-80	80-100
Frequency	15	10	35	50	40

Find the mode of the distribution.

20. The weekly pocket money of the students of class ix of a school are given in the following table:

Pocket money (in)	0-40	40-80	80-120	120-160	160-200	200-240
Number of students	5	7	15	10	5	8

Find the median for the above data.

Section-D

Question numbers 21 to 31 carry four marks each.

21. Can the number 6^n , n being a natural number, end with the digit 5? Give reasons.

22. Draw the graph of the following pair of linear equations:

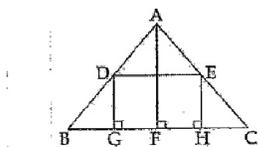
$$X+3y=6 \text{ and } 2x-3y=12$$

Find the ratio of the areas of the two triangles formed by first line, $x=0, y=0$ and second line $x=0, y=0$

23. Obtain all other zeroes of the polynomial $x^4 - 3\sqrt{2}x^3 + 3x^2 - 3\sqrt{2}x - x$ if two of its zeroes are $\sqrt{2}$ and $2\sqrt{2}$.

24. Mr. Sharma and Mr. Arora are family friends and they decided to go for a trip with family. For the trio they reserved their rail tickets. Mr. Arora has not taken a half ticket for his child who is 6 years old where as Mr, Sharma has taken half tickets for his two children who are 6.5 years and 8 years old. A railway half ticket costs half of the full fare but the reservation charges are the same as in a full ticket. Mr. and Mrs. Arora paid 1700, while Mr. and Mrs. Sharma paid 2700. Find the full fare of one ticket and the reservation charges per ticket what difference you find in their behavior and which one you will choose for yourself?

25. In the given figure, ABC is a triangle and GHED is a rectangle. $BC=12$ cm, $HE =6$ cm, $FC=BF$ and altitude $AF= 24$ cm. Find the area of the rectangle.



26. "In a triangle if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle'. Prove it.

27. If $\theta = 30^\circ$, verify the following:

i) $\cos 3\theta = 4\cos^3 \theta - 3\cos \theta$,

ii) $\sin 3\theta = 3\sin \theta - 4\sin^3 \theta$

28. Prove that:

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

29. $(\operatorname{cose} \theta - \sin \theta) / (\operatorname{cose} \theta + \sin \theta) = \sin \theta \cos \theta = \frac{1}{\tan \theta + \cot \theta}$

30. The daily income of 150 families is given below. Calculate the arithmetic mean.

Income	No. of families
More than 75	150
More than 85	140
More than 95	115
More than 105	95
More than 115	70
More than 125	60
More than 135	40
More than 145	25

31. The following table gives the daily income of 50 workers of a factory. Draw both types ('less than type' and 'greater than type') ogives.

Daily income (in)	100-120	120-140	140-160	160-180	180-200
Number of workers	12	14	8	6	10

Summative Assessment-1 2014-2015

Mathematics

Class - X

Time allowed: 3:00 hours

Maximum Marks: 90

General Instructions:

- a) All questions are compulsory.
- b) Question paper contains 31 questions divide into 4 sections A, B, C and D.
- c) Question No. **1 to 4** of **Section - A** are very short type questions, carrying 1 mark each. Question No. **5 to 10** of **Section - B** are of short answer type questions, carrying 2 marks each. Question No. **11 to 20** of **Section - C** carry 3 marks each. Question No. **21 to 31** of **Section - D** carry 4 marks each.
- d) There are no overall choices in the question paper.
- e) Use of calculator is not permitted.

Section A

Question numbers 1 to 4 carry 1 mark each.

1. In ΔPQR , E and F points on the sides PQ and PR respectively such that $EF \parallel QR$. If PE=6 cm, QE=2 cm and FR=3cm, then find PF.
2. Find the value of
$$\frac{1 \cdot \cos 36^\circ - 3 \cdot \sec 16^\circ}{3 \cdot \sin 54^\circ - 2 \cdot \operatorname{cosec} 74^\circ}$$
3. If $\tan \theta = \frac{1}{\sqrt{3}}$, find the value of $\sin(90^\circ - \theta)$
4. Write the empirical relationship between the three measures of central tendency.

Section B

Question numbers 5 to 10 carry 2 marks each.

5. Find the value of:
 $(-1)^n + (-1)^{2n} + (-1)^{2n+1} + (-1)^{4n+2}$, where n is any positive odd integer.
 6. Determine the values of m and n so that the prime factorization of 10500 is expressible as $2^m \times 3 \times 5^n \times 7$
 7. Find the zeroes of the quadratic polynomial $x^2 - 7x + 12$ and verify the relationship between the zeroes and the coefficients.
 8. Find the side of a rhombus whose diagonal are of length 60 cm and 80 cm.
 9. Simplify:
$$\frac{\tan 28^\circ}{\cot 62^\circ} \div \frac{1}{\sqrt{3}} [\tan 20^\circ \cdot \tan 60^\circ \cdot \tan 70^\circ]$$
 10. Given below is a cumulative frequency distribution table showing daily income of 50 workers of a factory:
-

Daily income (in Rs.)	More than or equal to 200	More than or equal to 300	More than or equal to 400	More than or equal to 500	More than or equal to 600
Number of workers	50	42	30	18	05

Draw cumulative frequency curve (ogive) 'of more than' type for this data.

Section C

Question number from 11 to 20 carry 3 marks each.

11. Prove that $\sqrt{8}$ is an irrational number.

12. Solve the following pair of equations for x and y:

$$\frac{4}{x} + 5y = 7$$

$$\frac{3}{x} + 4y = 5$$

13. Solve the following pair of linear equations by the elimination method:

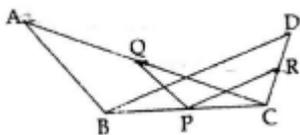
$$2x + 3y = 7$$

$$3x - 2y = 3$$

14. What should be added in the polynomial $3x^4 - 4x^3 - 6x^2 + 4$ so that it is completely divisible by $x^2 - 2$

15. In $\triangle ABC$, perpendicular drawn from A intersects BC at D such that $3DB = CD$. Prove that $2AB^2 = 2AC^2 - BC^2$

16. In the figure $\triangle ABC$ and $\triangle DBC$ have same base BC and lie on the same side. If $PQ \parallel BA$ and $PR \parallel BD$, then prove that $QR \parallel AD$



17. Prove that:

$$(1 + \tan A + \cot A) \cdot (\sin A - \cos A) = \sin A \cdot \tan A - \cot A \cdot \cos A$$

18. Evaluate:

$$\frac{\sec \theta \cdot \operatorname{cosec}(90^\circ - \theta) - \tan \theta \cdot \cot(90^\circ - \theta) + \sin^2 55^\circ + \sin^2 35^\circ}{\tan 10^\circ \cdot \tan 20^\circ \cdot \tan 60^\circ \cdot \tan 70^\circ \cdot \tan 80^\circ}$$

19. Heights of students of class X are given in the following frequency distribution:

Height (in cm)	150-155	155-160	160-165	165-170	170-175
Number of students	15	8	20	12	5

Find the modal height.

20. A school conducted a test (of 100 marks) in English for students of class X. The marks obtained by students are shown in the following table:

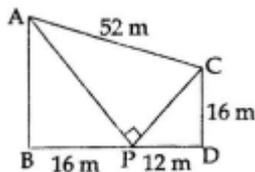
Marks obtained	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Number of students	1	2	4	15	15	25	15	10	2	1

Find the modal marks.

Section D

Questions 21 to 31 carry 4 marks each.

- State Euclid division Lemma. Using it show that square of any positive integer is either of the form $5m$ or $5m \pm 1$, where m is an integer.
- On the independence day celebration in the school, number of students participated in the celebration. School management has decided to distribute some sweets amongst the participants and the audience. If total number of sweets were represented by $8x^4 + 14x^3 - 2x^2 + 7x - 8$, each one received $2x^2 + 2x - 1$ sweets and $14x - 10$ remained undistributed, find the number of students to whom sweets were distributed.
- If a polynomial $-2x^4 - 3x^3 + 6x^2 + 3x - 2$ is divided by another polynomial $-2x^2 - 3x + 4$, then remainder is $px + q$. Find the value of p and q .
- Mini scored 150 marks in a test getting 3 marks for each correct answer and losing 2 marks for each wrong answer. Had 4 marks been awarded for each correct answer and 1 mark been deducted for each incorrect answer, then she would have scored 250 marks. How many questions were there in the test, if she attempted all the questions.
- In the given figure, AB and CD are two pillars P is a point on BD such that $BP = 16$ m and $PD = 12$ m. If $CD = 16$ m and $AC = 52$ m, then find AB and AP when it is given that $\angle APC = 90^\circ$



- If $\triangle ABC \sim \triangle DEF$ and AX, DY are respectively the medians of $\triangle ABC$ and $\triangle DEF$. Then prove that
 - $\triangle ABX \sim \triangle DEY$
 - $\triangle ACX \sim \triangle DFY$
 - $\frac{AX}{DY} = \frac{BC}{EF}$
- Given that $\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \cdot \tan B}$; evaluate $\tan 15^\circ$ in two ways.
 - Taking $A = 60^\circ, B = 45^\circ$
 - Taking $A = 45^\circ, B = 30^\circ$
- If $\tan \theta + \frac{4}{\tan \theta} = 5$, find $\sin \theta$ and $\cos \theta$.
- If $x = \cot A + \cos A = \cot A - \cos A$; prove that:

$$\left(\frac{x-y}{x+y}\right)^2 + \left(\frac{x-y}{2}\right)^2 = 1$$

30. The annual profits earned by shops of a particular shopping mall are given in the following distribution:

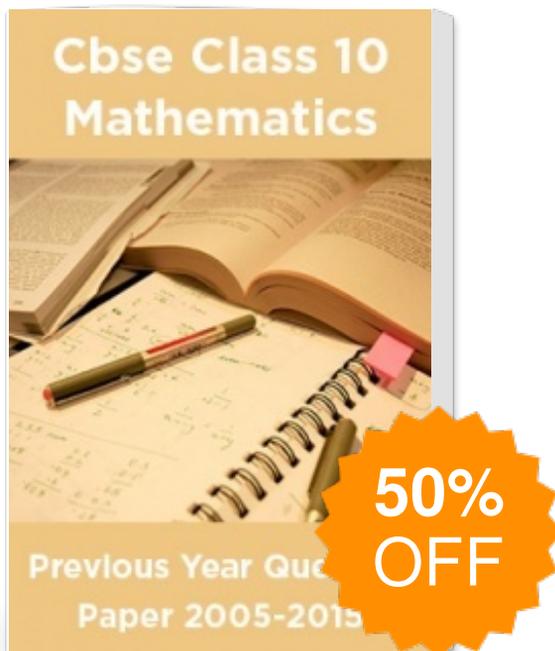
Profit (in lakh)	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Number of shops	4	8	15	20	25	18	12	7	3

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

31. In a check-up of heart beat rate of 50 females, it was found that median heart beat is 78. Find the missing frequencies f_1 and f_2 in the following frequency distribution:

Number of heart beats per minute	64-68	68-72	72-76	76-80	80-84	84-88	88-92
Number of females	4	5	f_1	f_2	9	7	1

Cbse Class 10 Mathematics Previous Year Question Paper 2005-2015



Publisher : Faculty Notes

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