

CBSE Model Paper -01
SUMMATIVE ASSESSMENT –I
Class – X (Mathematics)

Time allowed: 3 hours

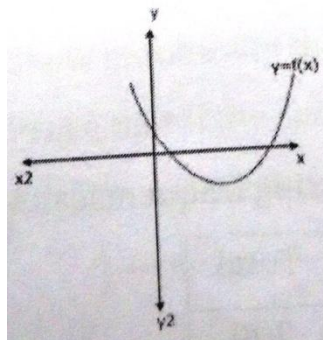
Maximum Marks: 90

General Instructions:

- All questions are compulsory.
- The question paper comprises of 31 questions divided into four sections A, B, C and D. You are to attempt all the four sections.
- Questions 1 to 4 in section A are one mark questions.
- Questions 5 to 10 in section B are two marks questions.
- Questions 11 to 20 in section C are three marks questions.
- Questions 21 to 31 in section D are four marks questions.
- There is no overall choice in the question paper. Use of calculators is not permitted.

SECTION – A

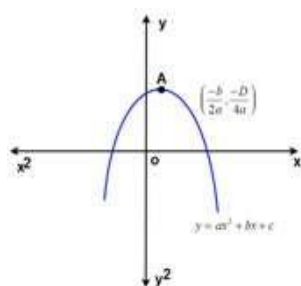
- Find the mode of the following data:
120, 110, 130, 110, 120, 140, 130, 120, 140, 120.
- Without actually performing long division, state whether $\frac{1}{3}$ will have terminating or non - terminating repeating decimal expansion. Also find the number of decimal places after which the decimal expansion terminates.
- Identify the given graph corresponds to a linear polynomial or a quadratic polynomial.



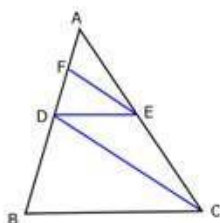
- Prove that $\cot^2 \theta - \frac{1}{\sin^2 \theta} = -1$

SECTION - B

5. The perimeter of two similar triangles are 30 cm and 20 cm. If one side of the first triangle is 12 cm, determine the corresponding side of the second triangle.
6. The graph of $y = ax^2 + bx + c$ is given in the following figure. Identify the signs of a , b and c



7. In the given figure, $DE \parallel BC$ and $CD \parallel EF$. Prove that $AD^2 = AB \times AF$.



8. If $\sin\theta + \sin^2\theta = 1$, find the value of $\cos^{12}\theta + 3\cos^{10}\theta + 3\cos^8\theta + \cos^6\theta + 2\cos^4\theta + 2\cos^2\theta - 2$
9. For the following grouped frequency distribution, find the mode.

Class	3-6	6-9	9-12	12-15	15-18	18-21	21-24
Frequency	2	5	10	23	21	12	3

6. 5. A
10. ABC is a right triangle, right angled at C. If $A = 30^\circ$ and $AB = 40$ units, find the remaining two sides and $\angle B$ of $\triangle ABC$.

SECTION - C

11. Prove that 2^{-1} is irrational.
12. Solve: $ax - by = a^2 - b^2$
13. The mean of the following frequency distribution is 1.46. Find the missing frequencies.

Number of accidents (x)	0	1	2	3	4	5	Total
Frequency (f)	46	f_1	f_2	25	10	5	200

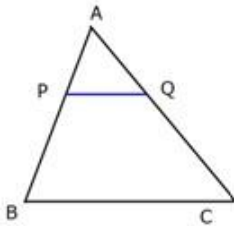
14. A ladder 15 m long reaches a window which is 9 m above the ground on one side of a street. Keeping its foot at same point, the ladder is turned to other side of the street to reach

a window 12 m high. Find the width of the street.

15. If $\sin(A + B) = 1$ and $\cos(A - B) = \frac{1}{2}$, $0^\circ < A + B \leq 90^\circ$, $A > B$ then find A and B.
16. Prove $(\sin\theta + \operatorname{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$
17. Find the values of x and y if the total frequency and the median of the following data is 100 and 525, respectively.

Class Interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
Frequency	2	5	x	12	17	20	y	9	7	4

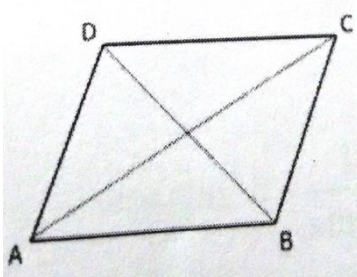
18. P and Q are points on sides AB and AC, respectively of ΔABC . If $AP = 3$ cm, $PB = 6$ cm, $AQ = 5$ cm and $QC = 10$ cm, show that $BC = 3PQ$.



19. If α and β are the zeros of the quadratic polynomial $f(x) = 2x^2 - 5x + 7$, find the polynomial whose zeros are $2\alpha + 3\beta$ and $3\alpha + 2\beta$.
20. Prove that $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = 0$

SECTION D

21. Find all the zeros of the polynomial $f(x) = 2x^4 - 3x^3 - 3x^2 + 6x - 2$, if two of its zeros are $\frac{1}{2}$ and $-\frac{1}{2}$.
22. Show graphically that the system of equations $2x + 4y = 10$; $3x + 6y = 12$ has no solution.
23. Prove that if the corresponding sides of two triangles are proportional, then they are similar.
24. ABCD is a rhombus. Prove that $AB^2 + BC^2 + CD^2 + DA^2 = AC^2 + BD^2$



25. If _____ — Prove that _____ .
26. If $(\sec A + \tan A)(\sec B + \tan B)(\sec C + \tan C) = (\sec A - \tan A)(\sec B - \tan B)(\sec C - \tan C)$, prove that each of the side is equal to ± 1 .
27. Apply step-deviation method to find the arithmetic mean of the following frequency distribution.

Variate (x)	5	10	15	20	25	30	35	40	45	50
Frequency (f)	20	43	75	67	72	45	39	9	8	6

28. If $\operatorname{cosec} A = \frac{1}{\sin A}$ find the value of _____
29. Draw a cumulative frequency curve and cumulative frequency polygon for the following frequency distribution by less than method.

Age (in years)	0-9	10-19	20-9	30-39	40-49	50-59	60-69
Number of persons	5	15	20	23	17	11	9

30. A train covered a certain distance at a uniform speed. If the train would have been 6 km/hr faster, it would have taken 4 hours less than the scheduled time. And, if the train were slower by 6 km/hr, it would have taken 6 hours more than the scheduled time. Find the length of the journey.
31. The percentage of salary that 10 households donate to an orphanage is given below: 5, 3, 10, 5, 2, 4, 7, 8, 1, 5
Find the mean, median and mode of the data. Also tell the values depicted by the persons of these households.

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