SUMMATIVE ASSESSMENT – I MATHEMATICS
Class – IX

**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 in Sections-A one mark questions

1. Simplify: $(-3 + \sqrt{7})(-3 - \sqrt{7})$

2. Factorise: $125x^3 - y^3$

3. In the figure, for what value of 'x' is $l1 \parallel l2$?
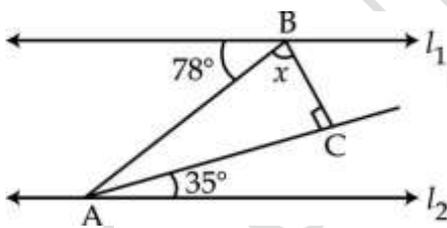
4. Write the distance of point R (2, 5) from x-axis.

Section-B comprises of 6 questions of 2 marks each

5. Rationalise the denominator of $\frac{6 - 4\sqrt{2}}{6 + 4\sqrt{2}}$

6. Factorise: $16/9x^2 – 1/4y^2$

7. Two lines AB and CD are intersected by a transversal l in the figure. Find the value of x and then show that the lines are not parallel.
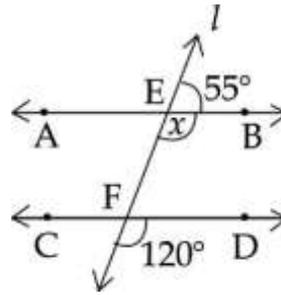
8. Consider two postulates given below:

(i) Given any two distinct points R and S, there exists a third point T which is in between R and S.

(ii) There exist at least three points which are not in the same straight line and answer the following questions :

(a) Do these postulates contain any undefined terms ?
(b) Do they follow from Euclid's postulates ? Explain.

Ans:Q8. (a)The postulates (I) undefined terms like "between A and B ". It is unclear where pint C lies- on the line AB , Above or below line AB. There are other undefined term like pint, line etc.

(b) Both postulate are consistent as they do not oppose each other and refer to two different situation

These postulates do not follow from Euclid's postulates. They follow from the axiom, "Given two distinct points, there is a unique line that passes through them".

9. An isosceles triangular field's perimeter is 250 m and each equal side is 100 m. Find the area of the field. (Use $\sqrt{15}$ = 3.87)

10. Plot the point (- 5, 1) and from it draw PM and PN perpendicular to x-axis and y-axis respectively. Write the co-ordinates of M and N.

Question numbers 11 to 20 in Sections - C are three marks questions
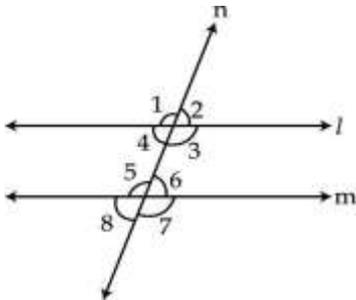
11. Simplify: x if $\frac{2^{x-2} - 2^x}{2^{x+2} - 2^x}$

OR, Find value of x if $2^{x-5} \times 5^{x-4} = 5$

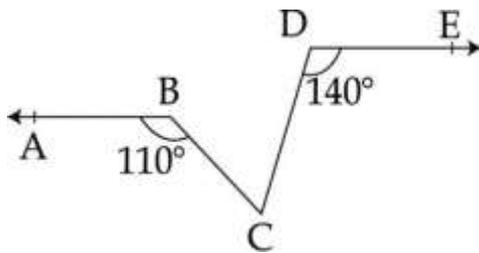12. Find the values of a and b if $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$

13. Factorise: $x^2 + 3\sqrt{3} x + 6$

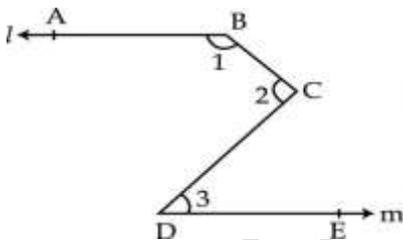14. If $x^2 + y^2 = 58$ and $x - y = 10$, then find the value of $x^3 - y^3$

15. In figure if line l is parallel to m and

$< 3 = (x + 60)^0$; $<6 = (2x + 15)0$, find < 1 and < 8

.

16. In the figure, AB II DE, $< ABC = 110^0$ and $<CDE$ 140^0. Find $<BCD$.

17. In figure, l II m. Prove that $< 1 + < 2 - < 3 = 180^0$

18. In the given figure, AOB is a straight line and ray OC stands on it. Bisectors of $< AOC$ and $<COB$ are OD and OE respectively. If $<DOC = x^0$, find $< COE$

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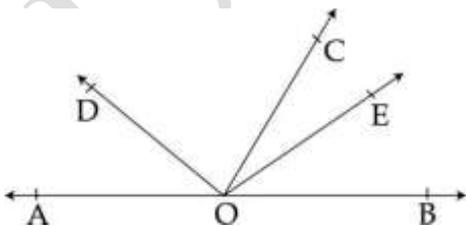
19. A quadrilateral park ABCD has $< C = 90^0$, AB = 13 m, BC = 12 m, CD = 9 m and AD = 14 m. Find its area.

20. The shape of cross-section of a canal is a trapezium. If the canal is 10 m wide at the top and 6 m wide at the bottom and the area of the cross-section is 72 m2, find its depth.

Question numbers 21 to 31 in Sections – D are four marks questions.

21. Simplify: $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6}+\sqrt{2}}$

22. Simplify : $\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$

23. If $(x + 1)$ and $(x + 2)$ are the factors of $x^3 + 3x^2 - 3\alpha x + \beta$, then find α and β

.

24. If $(x^2 - 1)$ is a factor of $ax^4 + bx^3 + cx^2 + d\,x + e$, show that $a + c + e = b + d = 0$

25. if $z^2 + \frac{1}{z^2} = 14$, find the value of if $z^3 + \frac{1}{z^3}$ taking only positive value of $z + \frac{1}{z}$

26. Prove that: $(x + y)^3 + (y + z)^3 + (z + x)^3 - 3(x + y)(y + z)(z + x) = 2(x^3 + y^3 + z^3 - 3xyz)$

27. In a school, students were asked by their teacher to plant trees around the school to reduce air pollution. What value is being inculcated in them ?

In a $\triangle$ ABC if $< A = 45$ and $<B = 70$ determine the shortest and largest sides of the triangle.

28. Show that in aright triangle if one of the acute angle is double the other than prove that hypotenuse id double the shortest side.

29. Prove that sum of the two sides of triangle is greater than third.

30. S is any point interior of triangle PQR, prove that PQ + PR > QS + RS

31. If the arms of one angle are respectively parallel to the arms of another angle, show that the two angles are either equal or supplementary.