SUMMATIVE ASSESSMENT – I, 2015

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.

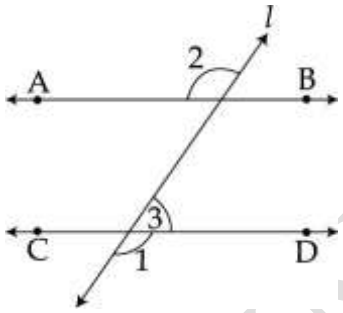
Section – A

Question numbers 1 to 4 in Sections-A one mark questions

1. Find the value of $(81)^{0.16} \times (81)^{0.09}$

2. Write $(x- 2)^3$ in the expanded form.

3. In the given figure, AB II CD and *l* is a transversal. If< 1 =110^0, find <2 and <3.



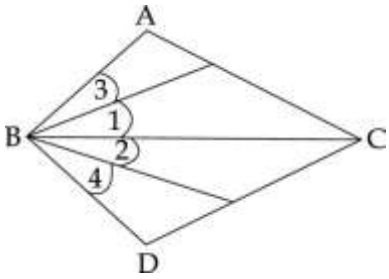
4. Point A is on *y*-axis and is at a distance of 3 units from *x*-axis on the positive side of *y*-axis. Write its coordinates.

Section-B comprises of 6 questions of 2 marks each

5. Simplify $\frac{2}{\sqrt{5}-\sqrt{3}}$ by rationalise the denominator.

6. Find (x + 1/x) if (x^2 + 1/x^2) = 23

7. In the given figure, we have < 1 = < 2 and < 3 = < 4. Show that <ABC = < DBC. State the Euclid's axiom used by you.



8. Two line segments AB and CD intersect each other at O such that AO = OB and CO = OD. Prove that AC= BD.

9. The longest side of a right angled triangle is 125 m and one of the remaining two sides is 100 m. Find its area using Heron's formula.

10. In the coordinate plane, draw a square of side 3 units, taking origin as one vertex. Also, write the coordinates of its vertices.

Question numbers 11 to 20 in Sections - C are three marks questions

11. Represent $\sqrt{4.2}$ on the number line.

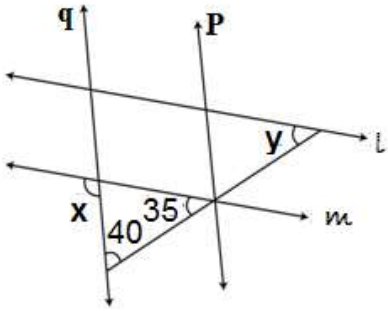
12. Find the values of a and b if $a + b\sqrt{6} = \frac{5+\sqrt{6}}{5-\sqrt{6}}$

13. One zero of the polynomial $2x^3 - 9x^2 - 2x = 24$ is 2. Find the other zeroes of the polynomial.

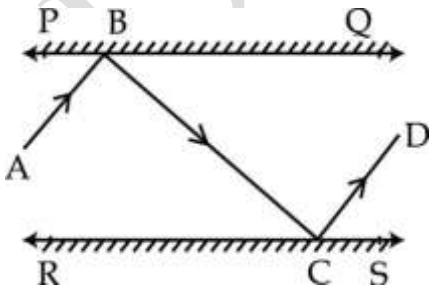
14. Factorise: $1000\,x^3 + 1331\,y^3 + 3300\,x^2y - 3630\,y^2x$

15. In Δ ABC, it is given that $<C - <A = 40^0$ and $<C - <B = 20^0$. Find $<A$, $<B$ and $<C$.

16. In the figure, find x and y if l II m and p II q.



17. In figure PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that AB II CD.



18. Prove that in a triangle exterior angle formed by producing one side of triangle is equal to its interior opposite angles.

19. If two diagonals of a rhombus are of lengths 90 m and 400 m, then find the height and perimeter of the rhombus.

20. Locate the points A(1, 6), B(0, 4), C(7, 0), D(- 2, - 2), E(4, - 1), F(2, - 3), G(- 1, 1) and H(- 2, - 3) in the cartesian plane.

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

21. if $x = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$ find the value of $x^2 + y^2 + xy$.

22. if $x = \frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}$ and $y = \frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$ find the value of $\frac{x2+y2+xy.}{x2+y2-xy}$

23. Find the values of p and q so that (x + 1) and (x - 1) are factors of $x^4 + px^3 + 2x^2 - 3x + q$

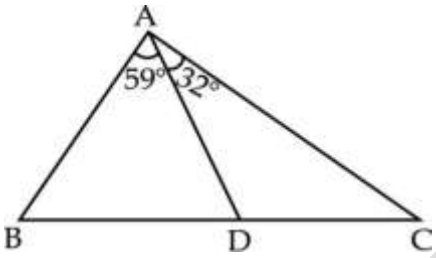
24. Give possible expressions for the length and breadth of the rectangle, in which the area is given by: as $25a^2 - 35a + 12$

25. If the polynomial b – x - $10x^2 + 8x^3$, is exactly divisible by 1 - x, then find value of b. Hence factories the polynomial.

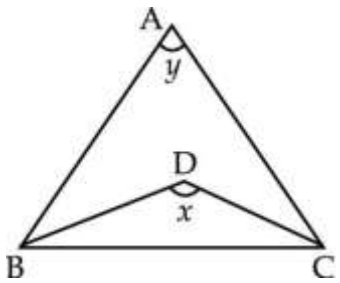
26. The polynomial p(x) = $x^4 - 2x^3 + 3x^2$ – ax + 3a - 7 when divided by (x + 1) leaves the remainder 19. Find 'a'. Then, find the remainder when p(x) is divided by x + 2

27. ABC is a triangle in which <B = 2 <C , D is point on side BC such that AD bisect <BAC and AB = CD .Prove that <BAC = 72^0

28. In the given figure AD = BD. Prove that BD < AC.



29. In Δ ABC, BD and CD are internal bisector of < B and < C respectively. Prove that 180 + <y = 2x.



30. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of a Δ PQR. Show that (i) Δ ABM ≅ Δ PQN (ii) Δ ABC ≅ Δ PQR

31. Prove that any two sides of a triangle are together greater than twice the median drawn to the third side.