Er Manish Bhadoria's
Interactions Study Circle
Strong Foundation for a bright future

Address: Nimbalkar's Goth – 2, Kampoo, Lashkar, Gwl
Contact: 8989-700-940 (M), 2424758 (O)
Website: manishbhadoria·blogspot·com

Mathematics

SA – 1 (Sep, 2013) **Mega Test - 1** **Class IX**

Time allowed: 3 hours **Maximum Marks: 90**

General Instructions:

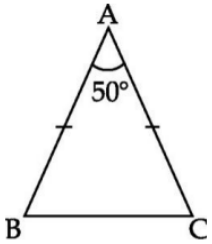
(i) All questions are compulsory.
(ii) The question paper consists of 31 questions divided into four sections A, B, C and D. Section A comprises of 4 questions of 1 mark each, section B comprises of 6 questions of 2 marks each, section C comprises of 10 questions of 3 marks each and section D comprises 11 questions of 4 marks each.
(iii) Question numbers 1 to 4 in section A are multiple choice questions where you are to select one correct option out of the given four.
(iv) There is no overall choice.
(v) Use of calculator is not permitted.

Section A

1. Rationalization factor of $\frac{1}{2\sqrt{3}-\sqrt{5}}$ is:
(a) $\sqrt{5} - 2\sqrt{3}$ (b) $\sqrt{3} + 2\sqrt{5}$
(c) $\sqrt{12} + \sqrt{5}$ (d) None of these

2. In ΔABC, $\angle A = \angle B/2 = \angle C/6$. Then the measure of $\angle A$ is:
(a) 60° (b) 30° (c) 40° (d) 20°

3. In the given figure, ABC is an isosceles triangle with AB = AC and $\angle A = 50°$, $\angle B$ is equal to:



(a) 50° (b) 65° (c) 90° (d) 130°

4. The sides of a Δ are 7 cm, 24 cm and 25 cm. Its area is:
(a) 168 cm² (b) 84 cm²
(c) 87.5 cm² (d) 300 cm²

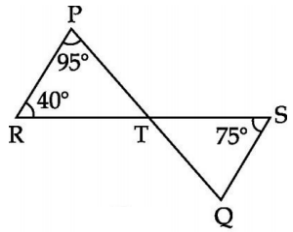
Section B

5. Express $0.2\bar{5}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

6. If $(x - 3)$ is a factor of $\sqrt{2}x^2 + (1 - 3\sqrt{2})x - k$, find k.

7. Check whether $7 + 3x$ is a factor of $3x^3 + 7x$ or not.

8. In figure, PQ and RS intersect at T and $\angle PRT = 40°$, $\angle RPT = 95°$ and $\angle TSQ = 75°$, find $\angle SQT$.



9. In ΔPQR, ∠P = 70°, ∠Q = 30°. Which side of this triangle is the longest? Give reasons for your answer.

10. Plot the points A (3, 0), B (3, 3) and C (0, 3) in a Cartesian plane. Join OA, AB, BC and CO. name the figure so formed and write its one property.

Section C

11. Find the value of 'a' and 'b' if $\frac{\sqrt{3}+1}{\sqrt{3}-1} = a + b\sqrt{3}$.

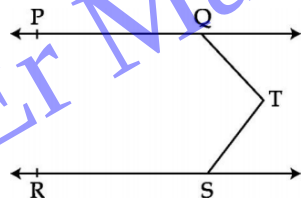
12. If a = 9 - 4√5 find the value of $a^2 + \frac{1}{a^2}$.

13. If f(x) = x² – 5x + 1, Evaluate:

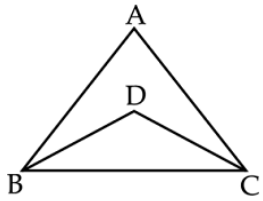
$$f(2) - f(-1) + f\left(\frac{1}{3}\right)$$

14. If x = √3 – 2, find the value of $\left(x + \frac{1}{x}\right)^3$.

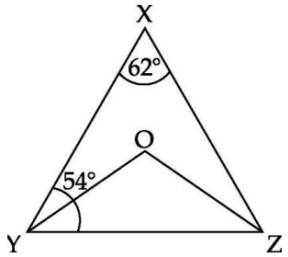
15. In the figure given below, PQ∥RS and T is any point as shown in the figure, then show that ∠PQT + ∠QTS + ∠RST = 360°.



16. In the figure below, AB = AC, DB = DC. Prove that ∠ABD = ∠ACD.



17. In the given figure, ∠X = 62°, ∠XYZ = 54°. If YO and ZO are the bisectors of ∠XYZ and ∠XZY respectively, find ∠OZY and ∠YOZ.



18. AB is a line segment and P is its midpoint. D and E are points on the same side of AB such that ∠BAD = ∠ABE and ∠EPA = ∠DPB. Show that ΔDAP ≅ ΔEBP.

19. If two parallel lines are intersected by a transversal, prove that the bisectors of the two pairs of interior angles enclose a rectangle.

20. In a parallelogram measure of adjacent sides are 34 cm and 20 cm. One of the diagonals is 42 cm. Find the area of the parallelogram.

Section D

21. Find the rational numbers a and b in the following:

$$\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a + b\sqrt{3}.$$

22. Express $32.1\overline{235}$ in the form of $\frac{p}{q}$.

23. Without actual division prove that $x^4 + 2x^3 - 2x^2 + 2x - 3$ is exactly divisible by $x^2 + 2x - 3$.

24. If (x + y) = 0, then prove that $(x^3 + y^3 + z^3) = 3xyz$.

25. Factorise: $x^3 - 9x^2 + 6x + 56$.

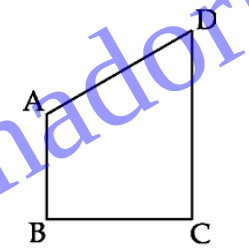
26. If x + y + z = 12 and $x^2 + y^2 + z^2 = 70$, then find the value of $x^3 + y^3 + z^3 - 3xyz$.

27. Write the co-ordinates of the vertices of a rectangle in III Quadrant whose length and breadth are 5 and 2 units respectively; one vertex is at the origin and the shorter side on y-axis.

28. Prove that if two lines intersect other, then the vertically opposite angles are equal.

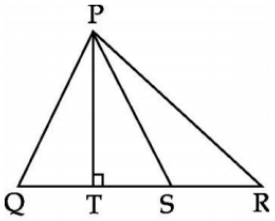
29. Prove that the sum of the interior angles of triangle is 180°.

30. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (as shown in figure below). Show that ∠A > ∠C.



31. In figure, PS is bisector of ∠QPR and OT ⊥ QR. Show that:

$$\angle TPS = \frac{1}{2}(\angle Q - \angle R).$$



---------- ----------