

**SUMMATIVE ASSESSMENT - I, 2014**  
**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.

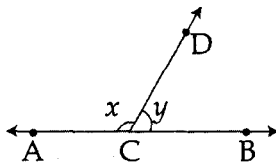
**SECTION-A**

Question numbers 1 to 4 carry one mark each

1 Find the value of  $\frac{3\sqrt{12}}{6\sqrt{27}}$  1

2 Write  $(3x + 1)^3$  in the expanded form. 1

3 In the figure, if ACB is a straight line and  $x : y = 2 : 1$ , find the values of  $x$  and  $y$  1



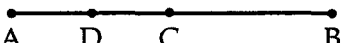
4 Write any two points lying on the negative direction of  $y$ -axis. 1

SECTION-B

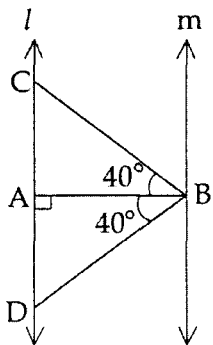
Question numbers 5 to 10 carry two marks each.

5 Find two rational numbers between 4 and 5. 2

6 Express  $\frac{x^2 - 2x + 1}{x^2 - 4x + 3}$  into lowest terms. 2

7  In figure C is the mid-point of AB and D is the midpoint of AC. Prove that  $AD = \frac{1}{4} AB$ . 2

8 In the figure,  $l \parallel m$ . If  $\angle ABC = \angle ABD = 40^\circ$  and  $\angle A = 90^\circ$ , then prove that  $\triangle BCD$  is isosceles. 2



9 Two sides of a triangle are 32 m and 40 m and its perimeter is 96 m. Find the area of the triangle. 2

10 In the coordinate plane, draw a rectangle having length 6 units, breadth 4 units and origin as one vertex. Also, write the coordinates of its vertices. 2

**SECTION-C**

Question numbers **11** to **20** carry three marks each.

11 Represent  $\sqrt{8.5}$  on the number line. 3

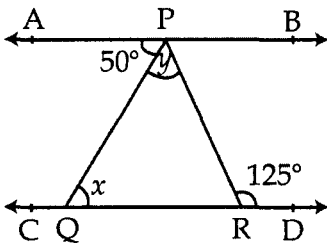
12 Simplify :  $\frac{\sqrt{72}}{5\sqrt{72} + 3\sqrt{288} - 2\sqrt{648}}$  3

13 Evaluate, using a suitable identity :  $102^3 - 2^3$  3

14 If  $x^2 + \frac{1}{x^2} = 98$ , then find the value of  $x^3 + \frac{1}{x^3}$  3

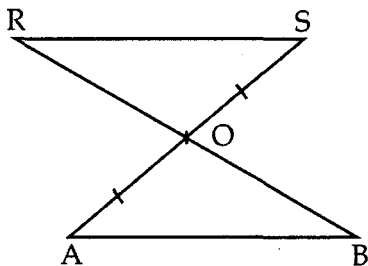
15 If the bisector of the exterior angle C of a  $\Delta ABC$  is parallel to the side AB, then prove that the triangle ABC is an isosceles triangle. 3

16 3



In figure, of  $AB \parallel CD$ ,  $\angle APQ = 50^\circ$ , and  $\angle PRD = 125^\circ$ , find  $y - x$ ,

17 3

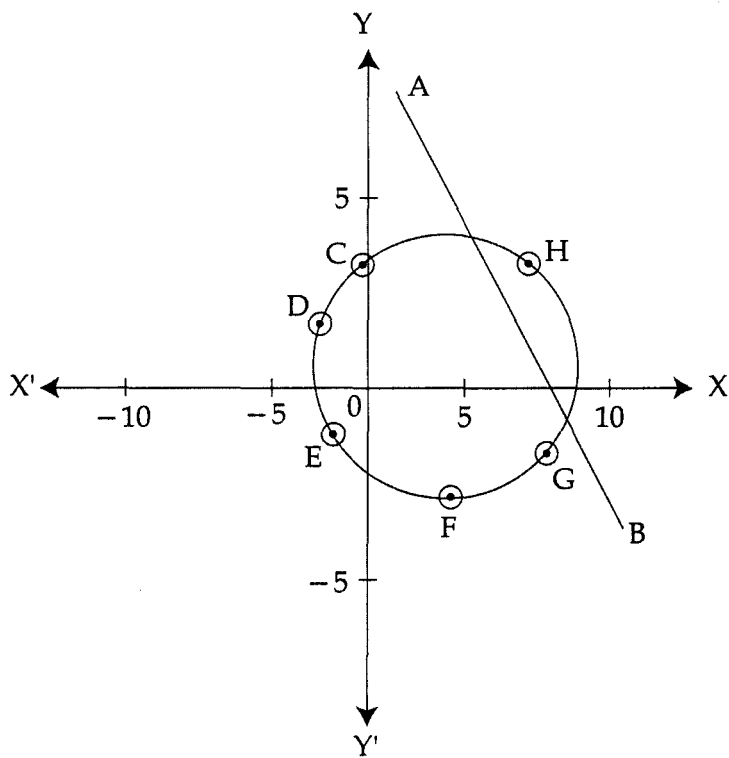


In the given figure if the line segment AB is parallel to another line segment RS and O is the mid point of AS then, Show that :

(i)  $\Delta AOB \cong \Delta SOR$

(ii) O is also mid point of BR

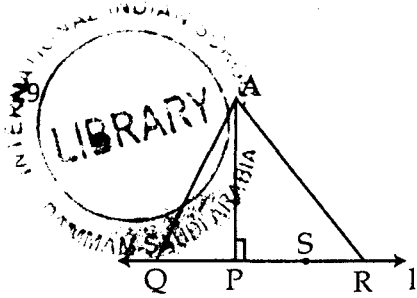
- 18 Prove that the angles opposite to equal sides of a triangle are equal. 3
- 19 A quadrilateral park ABCD has  $\angle C = 90^\circ$ ,  $AB = 13$  m,  $BC = 12$  m,  $CD = 9$  m and  $AD = 14$  m. Find its area. 3
- 20 Give coordinates of point of intersection of the circle and the line from the graph. Also, write coordinates of the points C, D, E, F, G and H. 3



#### SECTION-D

Question numbers 21 to 31 carry four marks each.

- 21 If  $x = \frac{1}{7+4\sqrt{3}}$  and  $y = \frac{1}{7-4\sqrt{3}}$ , find the value of  $x^3 + y^3$ . 4

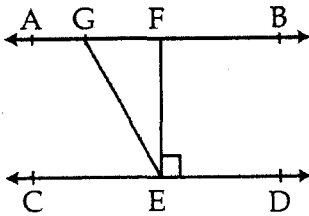


4

In figure  $AP \perp QR$ ,  $PR > PQ$  and  $PS = QP$ . Prove that  $AR > AQ$ .

- 30 ABC is a triangle and D is the mid-point of BC. The perpendiculars from D to AB and AC are equal. Prove that triangle is isosceles. 4

- 31 4



In the figure, if  $AB \parallel CD$ ,  $EF \perp CD$  and  $\angle GED = 126^\circ$ , find  $\angle AGE$ ,  $\angle GEF$  and  $\angle FGE$ .

22 If  $2^x \left[ \left( \frac{256}{81} \right)^x \right]^{1/4} = \frac{64}{9}$ , find the value of  $x$ . 4

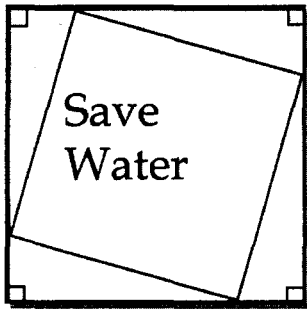
23 Find the value of  $m$ , if  $x + 3$  is a factor of the polynomial  $3x^2 + mx + 6$ . 4

24 If  $x + 5$  is a factor of  $x^3 + 2x^2 - 13x + 10$ , find its other factors. 4

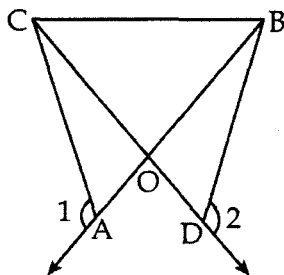
25 Show that  $2x + 1$  is a factor of the polynomial  $2x^3 + x^2 - 6x - 3$ . Hence factorise the polynomial. 4

26 Factorise :  $x^2 + \frac{1}{x^2} + 1$  4

27 Students are making banners, as shown in figure, to make people aware to save water for their community. What value are they showing by doing so? All corner angles of the banner are equal, which Euclid Postulate supports the fact? Write any two other Euclid Axioms.



28 4



In figure  $OA = OD$  and  $\angle 1 = \angle 2$ . Prove that  $\triangle OCB$  is an isosceles triangle.