

**Sample papers – 2014**  
**Class – IX**  
**Subject – Mathematics**

Max.Marks: - 90

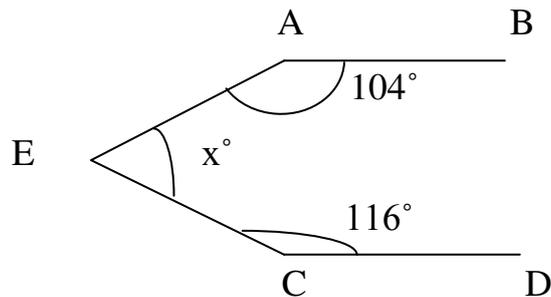
Time: - 3 hrs

**General Instructions:-**

1. All Questions are compulsory.
2. The paper consists of 34 questions divided into four Section A, B, C and D.
3. (i) Section A contains 8 MCQs of 1 mark each.  
(ii) Section B contains 6 questions of 2 marks each.  
(iii) Section C contains 10 questions of 3 marks each.  
(iv) Section D contains 10 questions of 4 marks each.

**SECTION-A**

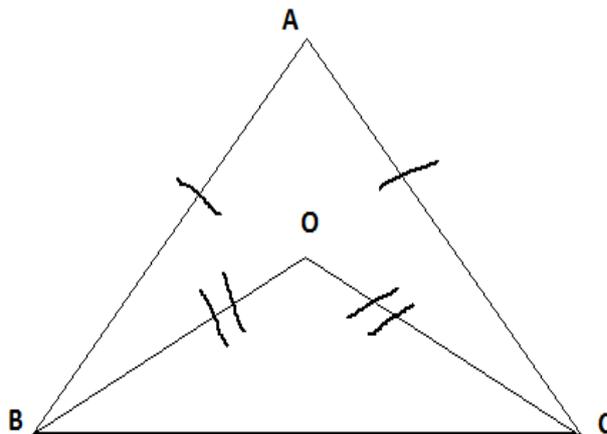
1. Which of the following is a rational number?  
a)  $\sqrt{2}$       b)  $\sqrt{23}$       c)  $\sqrt{225}$       d) 0.1010010001
2. If  $p(x) = x + 4$ , then  $p(x) + p(-x) = ?$   
a) 0      b) 4      c)  $2x$       d) 8
3. When  $(x^{31} + 31)$  is divided by  $(x + 1)$ , the remainder is  
a) 0      b) 1      c) 30      d) 31
4. The coefficient of  $x$  in the expansion of  $(x + 5)^3$  is  
a) 1      b) 15      c) 45      d) 75
5. Which of the following needs a proof ?  
a) An axiom      b) a theorem  
c) a definition      d) a Postulate.



6. Find  $x$  –

If  $AB \parallel CD$

- a)  $220^\circ$     b)  $12^\circ$     c)  $14^\circ$     d)  $140^\circ$
7. If  $x < 0$  and  $y > 0$ , then the point  $(x,y)$  lies in which quadrant  
 a) I    b) II    c) III    d) IV
8. In the given figure,  $AB = AC$  and  $OB = OC$ . Then  $\angle ABO : \angle ACO = ?$   
 a) 1 : 1    b) 2:1    c) 1:2    d) None of these

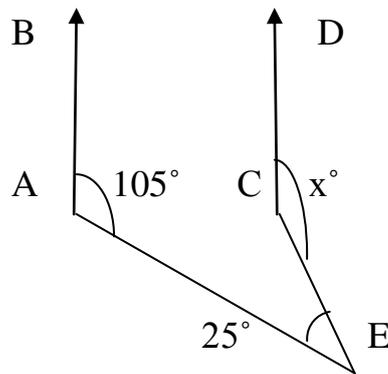


### SECTION-B

9. Evaluate :-  $\sqrt{5+2\sqrt{6}}$
10. Divide  $(3x^3 + 16x^2 + 21x + 20)$  by  $(x + 4)$ .

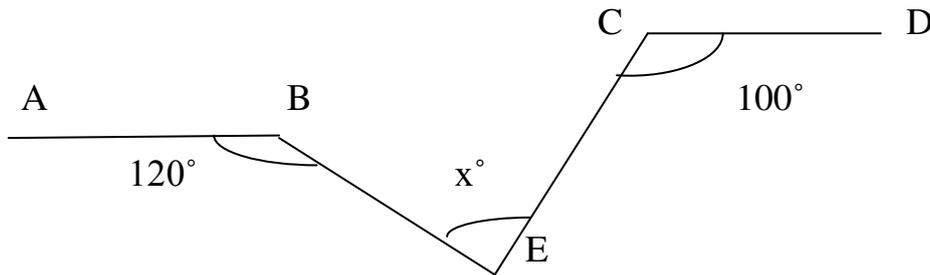
11. Find five rational numbers between  $\frac{3}{5}$  and  $\frac{4}{5}$ .
12. Write EUCLID'S five postulates.
13. In a  $\Delta ABC$ , if  $2\angle A = 3\angle B = 6\angle C$ , Calculate the measure of  $\angle A$ ,  $\angle B$  and  $\angle C$ .

14. In the given figure,  $AB \parallel CD$ . Find the value of  $x$ .

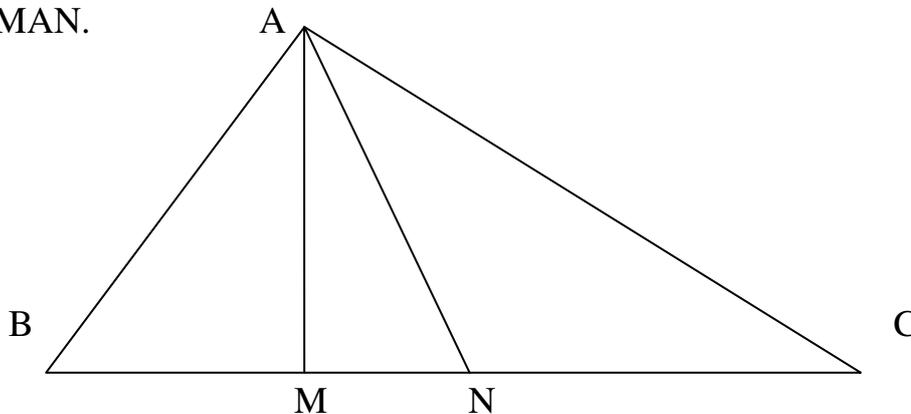


### SECTION-C

15. Prove that  $\sqrt{2}$  is an irrational numbers.
16. The polynomials  $(ax^3 + 3x^2 - 3)$  and  $(2x^3 - 5x + a)$  when divided by  $(x - 4)$  leave the same remainder. Find the value of  $a$ .
17. Factorize:  $2x^2 - \frac{5}{6}x + \frac{1}{12}$ .
18. If  $p=2 - a$ , Find the value of  $a^3 + 6ap + p^3 - 8$ .
19. State and prove angle sum property of a triangle.
20. In the given figure,  $AB \parallel CD$ . Find the value of  $x$ .



21. In a  $\Delta ABC$ , the interior bisectors of  $\angle B$  and  $\angle C$  intersect each other at a point  $O$ . Prove that  $\angle BOC = 90^\circ + \angle A$ .
22. In the given figure,  $AM \perp BC$  and  $AN$  is the bisector of  $\angle A$ . find the measure of  $\angle MAN$ .



If  $\angle ABC = 65^\circ$  and  $\angle ACB = 30^\circ$ .

23. Prove that in an isosceles triangle the altitude from the vertex bisects the base.
24. Factorize: -  $(a - b)^3 + (b - c)^3 + (c - a)^3$

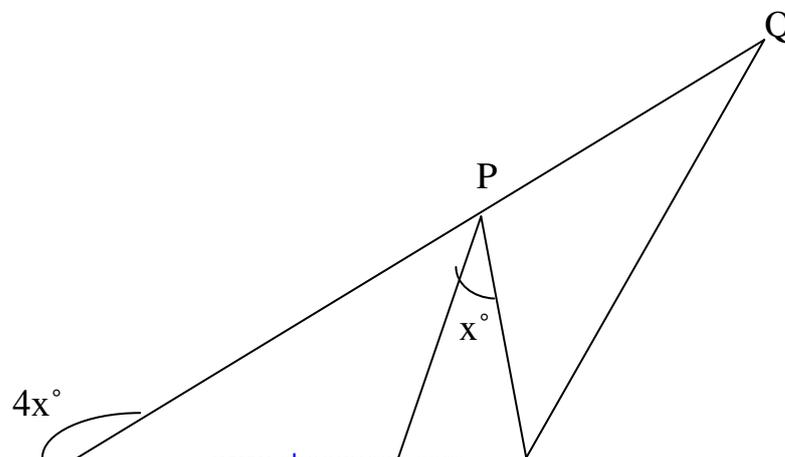
### **SECTION-D**

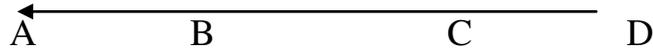
25. Represent  $\sqrt{8.47}$  on the real line.

26. If a and b are rational numbers and  $\frac{\sqrt{11}-\sqrt{7}}{\sqrt{11}+\sqrt{7}} = a - b\sqrt{77}$ , find the values of a and b.
27. If  $x + y + z = 1$ ,  $xy + yz + zx = -1$  and  $xyz = -1$ , find the value of  $x^3 + y^3 + z^3$ .
28. Find the area of a parallelogram ABCD in which AB = 14cm, BC=10cm and AC=16cm. [Use:  $\sqrt{3} = 1.73$ ].

29. Simplify:- 
$$\frac{(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3}{(a - b)^3 + (b - c)^3 + (c - a)^3}$$

30. The three vertices of  $\Delta ABC$  are A(1, 4), B(-2, 2) and C(3, 2). Plot these points on a graph paper and calculate the area of  $\Delta ABC$ .
31. Show that in a quadrilateral ABCD,  $AB + BC + CD + DA > AC + BD$ .
32. In figure, ABCD and BPQ are lines.  $BP=BC$  and  $DQ \parallel CP$ . Prove that  
 (i)  $CP = CD$       (ii) DP bisects  $\angle CDQ$ .





33.  $\triangle ABC$  is an isosceles triangle with  $AB=AC$ . Side  $BA$  is produced to  $D$  such that  $AB = AD$ . Prove that  $\angle BCD$  is a right angle.
34. In a right angled triangle, one acute angle is double the others. Prove that the hypotenuse is double the smallest side.

**Answer Key**

1. (c)
2. (d)
3. (c)
4. (d)
5. (b)
6. (d)
7. (b)
8. (a)
9.  $\sqrt{3} + \sqrt{2}$
10. Quotient =  $3x^2 + 4x + 5$  Remainder = 0
11.  $\frac{19}{30}, \frac{2}{3}, \frac{7}{10}, \frac{11}{15}$  and  $\frac{23}{30}$

12. ....

13.  $\angle A = 90^0$

$\angle B = 60^0$

$\angle C = 30^0$

14.  $130^0$

15. ....

16.  $a = 1$

17.  $\frac{1}{12}(4x - 1)(6x - 1)$

18. 0

19. The sum of the angles of a triangle is  $180^0$

20.  $x = 40^0$

21. ....

22.  $17.5^0$

23. ....

24.  $3(a - b)(b - c)(c - a)$

25. ....

26.  $a = \frac{9}{2}$  and  $b = \frac{1}{2}$

27.  $x^3 + y^3 + z^3 = 1$

28.  $138.4 \text{ cm}^2$

29.  $(a + b)(b + c)(c + a)$

30. 5 sq. units

31. ....

32. ....

33. ....

34. ....

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