

Name DT Class & Section IX-G Roll No. 11**FIRST TERMINAL EXAMINATION-2014-2015****Class-IX****Subject-Mathematics****Time Allowed : 3 Hrs.****M.M. : 90****Please Check the Total Marks***Do not write any answers on the questions paper. Check the total marks.***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.

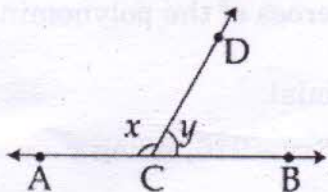
**Section-A**

Question numbers 1 to 4 carry one mark each.

1. Find the value of  $\left[ (16)^{\frac{1}{2}} \right]^{\frac{1}{2}}$  (1)

2. If  $(x + 1)$  is a factor of the polynomial  $2x^2 + kx$ , then find the value of  $k$ . (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  $x$ -axis. (1)

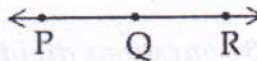
### Section-B

Question numbers 5 to 10 carry two marks each.

5. Simplify by rationalizing the denominator:  $\frac{16}{4-\sqrt{32}}$  (2)

6. Factorise:  $x^2 - 6\sqrt{2}x + 18$  (2)

7. If P, Q and R are three points on a line and Q lies between P and R, then prove that  $PQ + QR = PR$  (see figure). (2)



8. ABC is a right angled triangle in which  $\angle B = 90^\circ$  and  $AB = BC$ . Find  $\angle A$  and  $\angle C$ . (2)

9. Find area of an isosceles triangle which has perimeter 50 m and whose unequal side is 10 m. (Use  $\sqrt{15} = 3.87$ ) (2)

10. Name the quadrants in which the following points lie? (2)  
 $(-5, -4)$ ,  $(1, -3)$ ,  $(-6, 5)$  and  $(3, 2)$

### Section-C

Question numbers 11 to 20 carry three marks each.

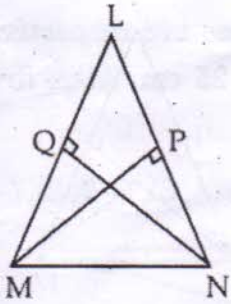
11. Find three rational numbers between  $\frac{5}{7}$  and  $\frac{9}{11}$  (3)

12. If  $x = \sqrt{2} - 1$ , find the value of  $\left(x - \frac{1}{x}\right)^3$  (3)

13. Show that  $-2$  and  $\frac{1}{4}$  are zeroes of the polynomial  $4x^3 - 5x^2 - 23x + 6$ . Also find the third zero of the polynomial. (3)

14. Find the value of  $x^3 - y^3 - 18xy - 216$ , When  $x - y = 6$  (3)

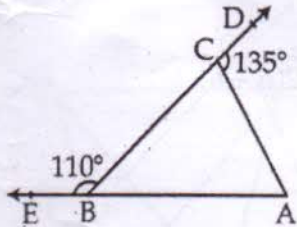
15. (3)



LMN is a triangle in which altitudes MP and NQ to sides LN and LM respectively are equal. Show that.

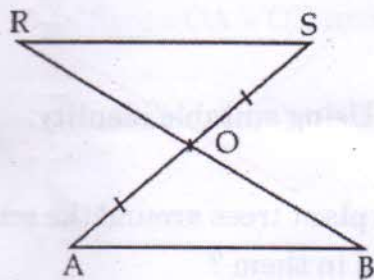
- (i)  $\triangle LMP \cong \triangle LNQ$
- (ii)  $LM = LN$  ie LMN is an isosceles triangle.

16. (3)



In figure, sides AB and BC of  $\triangle ABC$  are produced to point E and D respectively. If  $\angle EBC = 110^\circ$  and  $\angle ACD = 135^\circ$ , find  $\angle BAC$ .

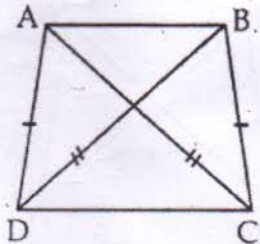
17. (3)



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)  $\triangle AOB \cong \triangle SOA$
- (ii) O is also mid point of BR

18. (3)



In figure  $AD = BC$  and  $BD = AC$  prove that  $\angle DAB = \angle CBA$ .

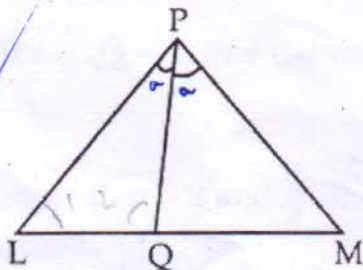
19. Find the area of a parallelogram ABCD whose adjacent sides are respectively of lengths 17 cm and 12 cm and the diagonal AC is of length 25 cm. Also, find the length of the perpendicular drawn from D on side AB. (3)
20. Draw a trapezium ABCD in which vertices A, B, C and D are (4, 6), (-2, 3), (-2, -3) and (4, -7) respectively. (3)

### Section-D

Question numbers 21 to 31 carry four marks each.

21. Simplify:  $\frac{1}{2+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{8}}$  (4)
22. If  $\frac{\sqrt{a}+\sqrt{b}}{\sqrt{a}-\sqrt{b}} + \frac{\sqrt{a}-\sqrt{b}}{\sqrt{a}+\sqrt{b}} = a - b$ , then show that  $a - b = \sqrt{2(a+b)}$ . (4)
23. Factorise:  $a^3 - b^3 + 1 + 3ab$  (4)
24. If  $p(x) = x^3 - 4x^2 + x + 6$ , then show that  $p(3) = 0$  and hence factorise  $p(x)$ . (4)
25. Factorise:  $6x^3 + 11x^2 - 12x - 5$  (4)
26. Prove that  $\frac{0.87 \times 0.87 \times 0.87 + 0.13 \times 0.13 \times 0.13}{0.87 \times 0.87 - 0.87 \times 0.13 + 0.13 \times 0.13} = 1$ , Using suitable identity. (4)
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? (4)
- In a  $\triangle ABC$  if  $\angle A = 45^\circ$  and  $\angle B = 70^\circ$  determine the shortest and largest sides of the triangle.

28.



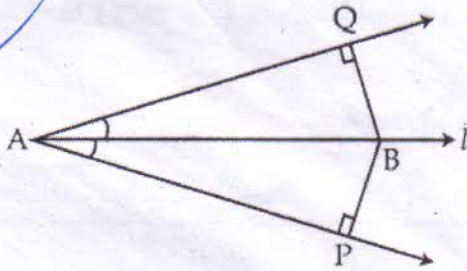
In the given figure, PQ is the bisector of  $\angle P$ .

Show that :

- (i)  $PL > LQ$  (ii)  $PM > QM$

29. If two lines intersect each other, then prove that the vertically opposite angles are equal. (4)

30.



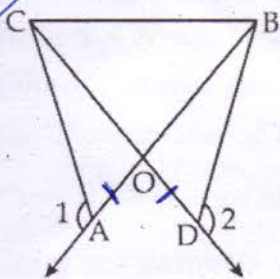
(4)

In given figure, line  $l$  is bisector of an angle  $\angle A$  and  $B$  is any point on  $l$ .  $BP$  and  $BQ$  are perpendiculars from  $B$  to the arms of  $\angle A$ , Show that

(i)  $\triangle APB \cong \triangle AQB$  and

(ii)  $BP = BQ$

31.



(4)

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