



विद्या सर्वार्थ साधिका

# ANANDALAYA

## PERIODIC TEST – 2

Class : IX

Subject: Mathematics

Date : 28/09/2019

M.M: 60

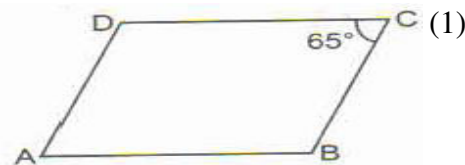
Time: 2½ Hours

### General Instructions:

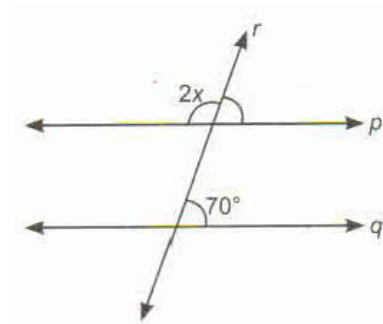
- All questions are compulsory.
- This question paper contains 29 questions.
- Question 1- 14 in Section A are very short-answer type questions carrying 1 mark each.
- Questions 15 – 18 in Section B are short-answer type questions carrying 2 marks each.
- Questions 19 – 24 in Section C are long-answer-I type questions carrying 3 marks each.
- Questions 25 – 29 in Section D is long-answer-II type questions carrying 4 marks.

### SECTION-A

- A  $\triangle ABC$ , right angled at B. Side AB = 6 cm and side BC = 8 cm. D is mid – point of AC. Then (1)  
length of BD is \_\_\_\_\_.  
(a) 10 cm (b) 4 cm (c) 3 cm (d) 5 cm
- Value of  $\sqrt[4]{(81)^{-2}}$  is \_\_\_\_\_. (1)  
(a) 1/9 (b) 1/3 (c) 9 (d) 1/81
- $x = 5, y = -2$  is a solution of the linear equation \_\_\_\_\_. (1)  
(a)  $2x + y = 9$  (b)  $2x - y = 12$  (c)  $x + 3y = 1$  (d)  $x + 3y = 0$
- $\angle x$  and  $\angle y$  are exterior angles of a  $\triangle ABC$ , at the point B and C respectively. Also  $\angle B > \angle C$ , then (1)  
relation between  $\angle x$  and  $\angle y$  is \_\_\_\_\_.  
(a)  $\angle x > \angle y$  (b)  $\angle x = \angle y$  (c)  $\angle x < \angle y$  (d) none of these
- Zeros of the polynomial  $p(x) = (x - 2)^2 - (x + 2)^2$  are \_\_\_\_\_. (1)  
(a) 2, - 2 (b) 2x (c) 0, - 2 (d) 0
- The ordinate of the point (4, - 5) is \_\_\_\_\_. (1)  
(a) 4 (b) 5 (c) - 5 (d) none of these
- In the given figure, ABCD is parallelogram. If  $\angle C = 65^\circ$ , then (1)  
( $\angle B + \angle D$ ) is equal to \_\_\_\_\_.  
(a)  $180^\circ$  (b)  $115^\circ$  (c)  $155^\circ$  (d)  $230^\circ$
- Simplify  $\sqrt{72} + \sqrt{800} - \sqrt{18}$ . (1)



9. For what value of  $k$ ,  $x = 2$  and  $y = -1$  is a solution of  $x + 3y - k = 0$ . (1)
10. "If two sides and an angle of one triangle are equal to two sides and an angle of another triangle, then two triangles must be congruent." Is this statement true or false? Justify your answer. (1)
11. If  $-1$  is a zero of the polynomial  $p(x) = ax^3 - x^2 + x + 4$ , then find the value of 'a'. (1)
12. A policeman and a thief are equidistant from the jewel box. Upon considering jewel box a origin, the position of policemen is  $(0, 5)$ . If the ordinate of the position of thief is zero, then write the coordinates of the position of thief. (1)
13. In the given figure,  $p \parallel q$ . Find the value of  $x$ . (1)



14. If the difference between two complementary angles is  $10^\circ$ , then find these angles. (1)

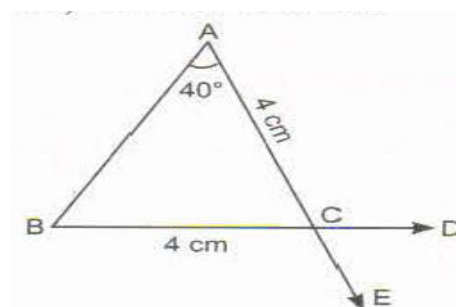
### SECTION-B

15. Find the value of  $a$ , if the line  $5y = ax + 10$ , will pass through (i)  $(2, 3)$  (ii)  $(2, 1)$ . (2)  
OR

At what point the graph of the linear equation  $x + y = 5$  cuts the  $x$  - axis and  $y$  - axis?

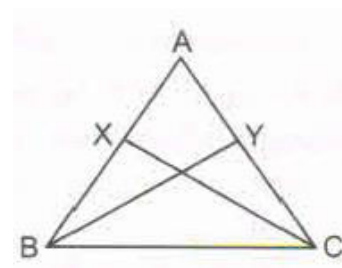
16. If  $x = 3 + 2\sqrt{2}$ , then find whether  $x + \frac{1}{x}$  is rational or irrational. (2)

17. In the given figure, if  $AC = BC = 4$  cm and  $\angle A = 40^\circ$ , then find  $\angle DCE$ . (2)

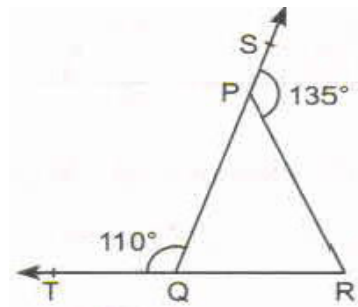


OR

In the figure given,  $ABC$  is a triangle in which  $AB = AC$ .  $X$  and  $Y$  are points on  $AB$  and  $AC$  such that  $AX = AY$ . Prove that  $\triangle ABY \cong \triangle ACX$ .



18. In the figure given, side QP and RQ of  $\Delta PQR$  are produced to points S and T respectively. If  $\angle SRP = 135^\circ$  and  $\angle PQT = 110^\circ$ , find  $\angle PRQ$ .



(2)

### SECTION-C

19. If  $2x + 3y = 12$  and  $xy = 6$ , find the value of  $8x^3 + 27y^3$ .

(3)

OR

Find the value of k, if  $x + k$  is the factor of the polynomials:

(i)  $x^3 + kx^2 - 2x + k + 5$  and (ii)  $x^4 - k^2x^2 + 3x - 6k$ .

20. (i) Plot the points A(0, 4), B(-3, 0), C(0, -4), D(3, 0)  
 (ii) Name the figure obtained by joining the points A, B, C and D.  
 (iii) Also name the quadrants in which sides AB and AD lie.

(3)

21. Prove that the angles opposite to equal sides of an isosceles triangle are equal.

(3)

22. Prove that  $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$

(3)

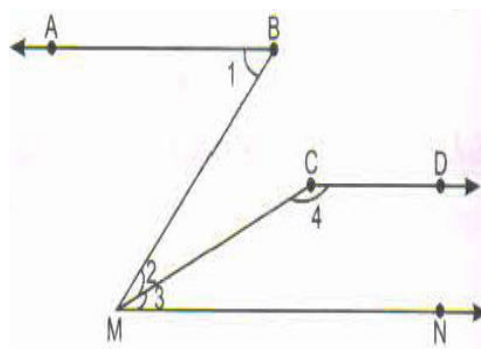
OR

Rationalise the denominator of  $\frac{4}{2+\sqrt{3}+\sqrt{7}}$ .

23. Determine the point on the graph of the linear equation  $2x + 5y = 19$ , whose ordinate is  $1\frac{1}{2}$  times its abscissa.

(3)

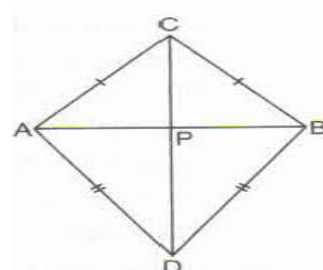
24. In the given figure,  $\angle 1 = 55^\circ$ ,  $\angle 2 = 20^\circ$ ,  $\angle 3 = 35^\circ$  and  $\angle 4 = 145^\circ$ . Prove that  $AB \parallel CD$ .



(3)

### SECTION-D

25. AB is a line segment C and D are points on opposite sides of AB such that each of them is equidistant from the point A and B as shown in figure. Show that the line CD is the perpendicular bisector of AB.

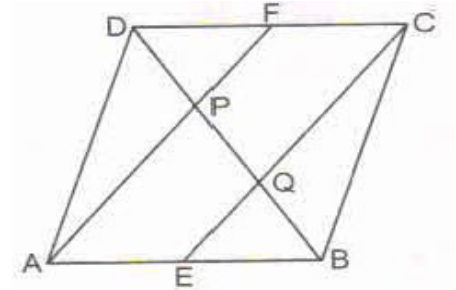


(4)

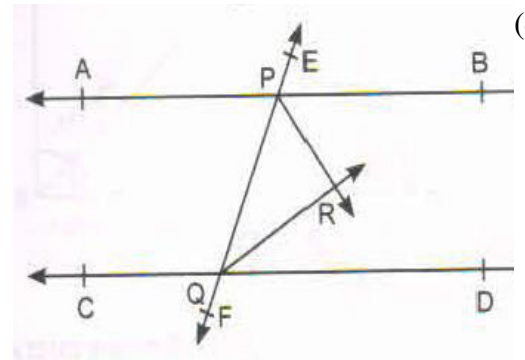
26. Evaluate the product without multiplying directly: (i)  $103 \times 107$  (4)  
 Evaluate by using suitable identities: (ii)  $(102)^3$
27. In  $\triangle ABC$  is isosceles with  $AB = AC$ . D, E and F are the mid-points of sides BC, CA and AB respectively. Show that the line segment AD is perpendicular to the line segment EF and is bisected by it. (4)

OR

In a parallelogram ABCD, E and F are the mid – points of sides AB and CD respectively (see the figure). Show that the line segments AF and EC trisect the diagonal BD.



28. Draw the graph of the linear equation  $3x + 4y = 6$ . At what points, the graph cuts the x – axis and the y – axis. (4)
29. In the given figure, AB and CD are two parallel lines intersected by a transversal EF. Bisector of interior angles BPQ and DQP intersect at R. Prove that  $\angle PRQ = 90^\circ$ . (4)



OR

In  $\triangle ABC$ , the bisector of  $\angle B$  and  $\angle C$  meet at O. Prove that  $\angle BOC = 90^\circ + \frac{\angle A}{2}$ .