

KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION
SAMPLE PAPER 01 FOR HALF YEARLY EXAM (2017-18)

SUBJECT: MATHEMATICS
CLASS : IX

MAX. MARKS : 80
DURATION : 3 HRS

General Instructions:

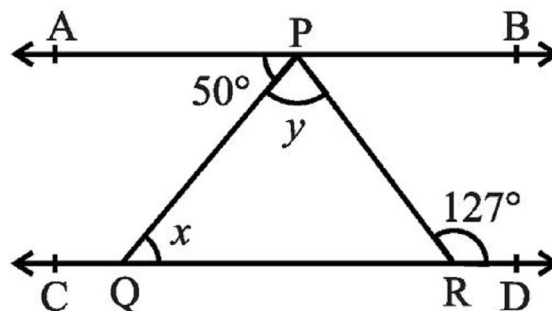
- (i). All questions are compulsory.
- (ii). This question paper contains **30** questions divided into four Sections A, B, C and D.
- (iii). **Section A** comprises of 6 questions of **1 mark** each. **Section B** comprises of 6 questions of **2 marks** each. **Section C** comprises of 10 questions of **3 marks** each and **Section D** comprises of 8 questions of **4 marks** each.
- (iv). Use of Calculators is not permitted

SECTION – A

1. State “PLAYFAIR” axiom.
2. Rationalize the denominator of $\frac{3 - \sqrt{2}}{3 + \sqrt{2}}$.
3. Find the value of k , if $x = 2, y = 1$ is a solution of the equation $2x + 3y = k$.
4. One of the angles of a triangle is 50° and the other two angles are equal. Find the measure of each of the equal angles.
5. If $x + 6$ is a factor of $p(x) = x^3 + 3x^2 + 4x + k$, find the value of k .
6. Write the coordinates of the point lying on x-axis and with x-coordinate 4.

SECTION – B

7. Show that $1.272727\dots$ can be expressed in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
8. In the below figure, if $AB \parallel CD$, $\angle APQ = 50^\circ$ and $\angle PRD = 127^\circ$, find x and y .

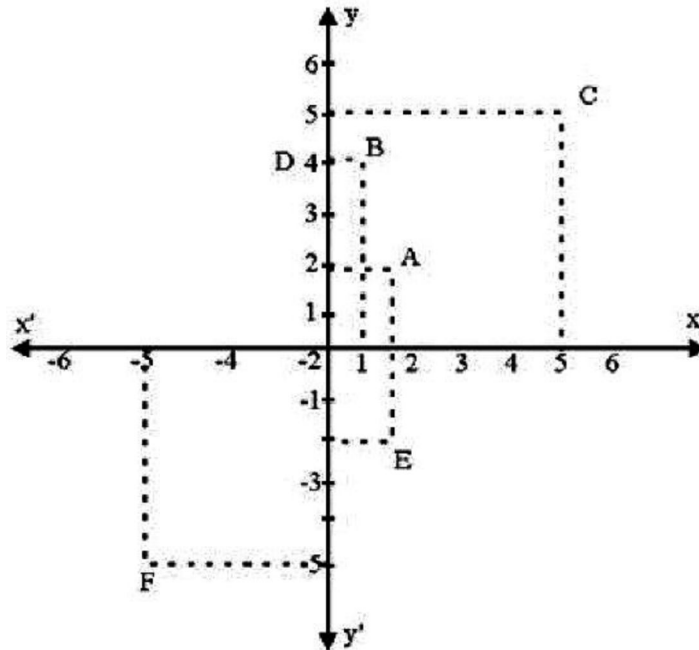


9. The angles of quadrilateral are in the ratio $3 : 5 : 9 : 13$. Find all the angles of the quadrilateral.
10. ABCD is a parallelogram, $AE \perp DC$ and $CF \perp AD$. If $AB = 16$ cm, $AE = 8$ cm and $CF = 10$ cm, find AD.
11. $\triangle ABC$ is right angled in which $\angle A = 90^\circ$ and $AB = AC$. Find $\angle B$ and $\angle C$.

12. Factorise: $27x^3 - \frac{1}{216} - \frac{9}{2}x^2 + \frac{1}{4}x$

SECTION – C

13. From the figure, find the coordinates of A, B, C, D, E and F. Which of the points are mirror image in (i) x – axis (ii) y – axis



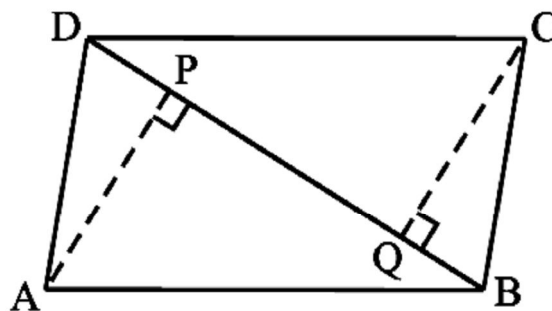
14. If $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$, find $x^2 + \frac{1}{x^2}$

15. If a and b are rational numbers and $\frac{7 - 4\sqrt{3}}{7 + 4\sqrt{3}} = a + b\sqrt{3}$, find the values of a and b.

16. If a point C lies between two points A and B such that $AC = BC$, then prove that $AC = \frac{1}{2} AB$.
Explain by drawing the figure.

17. Show that the diagonals of a parallelogram divide it into four triangles of equal area.

18. In the below figure, ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD. Show that (i) $\triangle APB \cong \triangle CQD$ (ii) $AP = CQ$

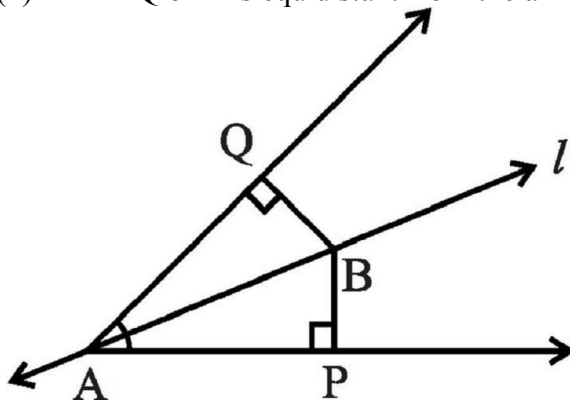


19. The Autorikshaw fare in a city is charged Rs 10 for the first kilometer and @ Rs 4 per kilometer for subsequent distance covered. Write the linear equation to express the above statement. Draw the graph of the linear equation.

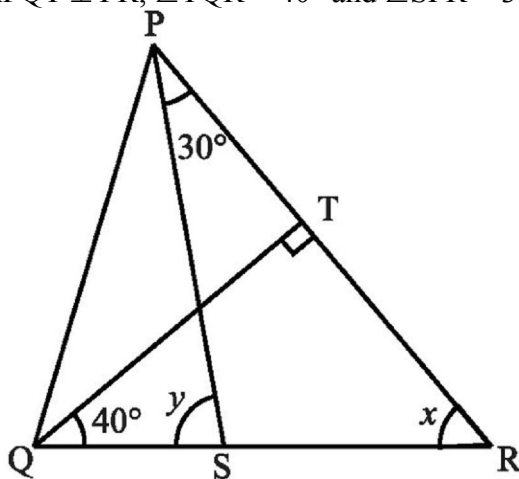
20. Without actual division, prove that $2x^4 - 5x^3 + 2x^2 - x + 2$ is divisible by $x^2 - 3x + 2$.

21. Line l is the bisector of an angle $\angle A$ and B is any point on l . BP and BQ are perpendiculars from B to the arms of $\angle A$ (see the below figure). Show that:

(i) $\triangle APB \cong \triangle AQB$ (ii) $BP = BQ$ or B is equidistant from the arms of $\angle A$.



22. In the above sided figure, if $QT \perp PR$, $\angle TQR = 40^\circ$ and $\angle SPR = 30^\circ$, find x and y .



SECTION - D

23. Simplify $\frac{4 + \sqrt{5}}{4 - \sqrt{5}} + \frac{4 - \sqrt{5}}{4 + \sqrt{5}}$ by rationalizing the denominator.

24. If in two right triangles, hypotenuse and one side of a triangle are equal to the hypotenuse and one side of other triangle, prove that the two triangles are congruent

25. Solve the equation $2x + 1 = x - 3$, and represent the solution(s) on
 (i) the number line,
 (ii) the Cartesian plane.

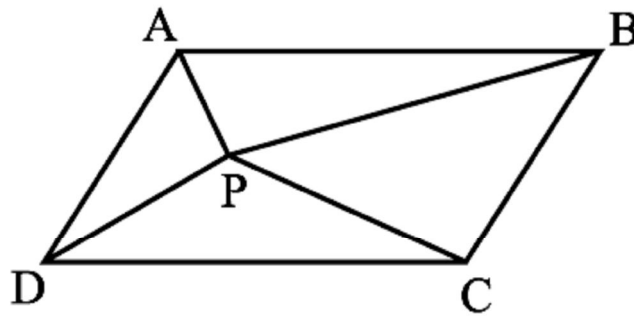
26. The polynomial $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ when divided by $(x - 1)$ and $(x + 1)$ leaves the remainders 5 and 19 respectively. Find the values of a and b . Hence, find the remainder when $f(x)$ is divided by $(x - 3)$.

27. ABCD is a rectangle and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.

28. In the below figure, P is a point in the interior of a parallelogram ABCD. Show that

(i) $\text{ar}(\text{APB}) + \text{ar}(\text{PCD}) = \frac{1}{2} \text{ar}(\text{ABCD})$

(ii) $\text{ar}(\text{APD}) + \text{ar}(\text{PBC}) = \text{ar}(\text{APB}) + \text{ar}(\text{PCD})$



29. Plot the following points on a graph paper:

| | | | | | |
|---|---|---|----|----|----|
| x | 1 | 2 | 3 | 4 | 5 |
| y | 5 | 8 | 11 | 14 | 17 |

Join these points. What do you observe?

30. In the above sided figure, the sides AB and AC of a triangle ABC are produced to points E and D respectively. If bisectors BO and CO of $\angle \text{CBE}$ and $\angle \text{BCD}$ respectively meet at point O, then

prove that $\angle \text{BOC} = 90^\circ - \frac{1}{2} \angle \text{BAC}$.

