

BLUE PRINT : SA-I (IX) : MATHEMATICS

Unit/Topic	MCQ (1 mark)	Short answer (2 marks)	Short answer (3 marks)	Long answer (4 marks)	Total
Number System	1(1)	2(1)	6(2)	8(2)	17(6)
Algebra	--	4(2)	9(3)	12(3)	25(8)
Polynomials					
Geometry					
Euclids Geometry, Lines and Angles, Triangles	1(1)	4(2)	12(4)	20(5)	37(12)
Coordinate Geometry	1(1)	2(1)	3(1)	--	6(3)
Mensuration	1(1)	--	--	4(1)	5(2)
Total	4(4)	12(6)	30(10)	44(11)	90(31)

SAMPLE PAPER – I

Class – IX
Subject: Mathematics

Max. Marks: 90
Time Allowed: 3 hrs

General Instruction:

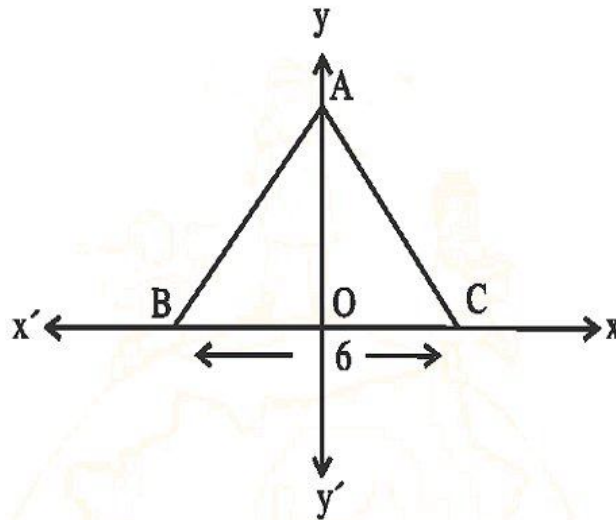
- (i) All questions are compulsory.
 - (ii) The question paper consists of 31 questions divided into four sections A, B, C and D.
 - (iii) Section A contains 4 multiple-choice questions of 1 mark each. Section B contains 6 questions of 2 marks each. Section C contains 10 questions of 3 marks each. Section D contains 11 questions of 4 marks each.
 - (iv) Use of calculator is not permitted.
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SECTION – A

1. Find the value of $(\sqrt{5} + \sqrt{2})(\sqrt{5} - \sqrt{2})$.
2. State “PLAYFAIR” axiom.
3. Write the coordinates of the point lying on x-axis and with x-coordinate 4
4. If the area of an equilateral triangle is $36\sqrt{3}$ cm², then find its perimeter.

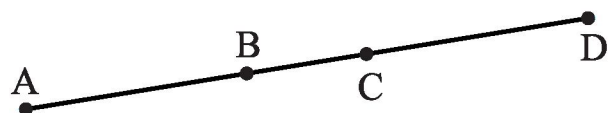
SECTION – B

5. ABC is an equilateral as shown in figure. Find the coordinates of its vertices.



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

7. Factorize the polynomial: $8x^3 - (2x - y)^3$.



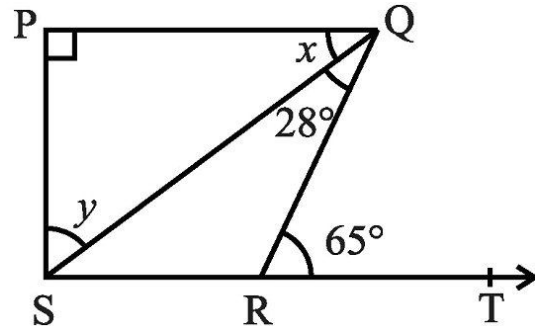
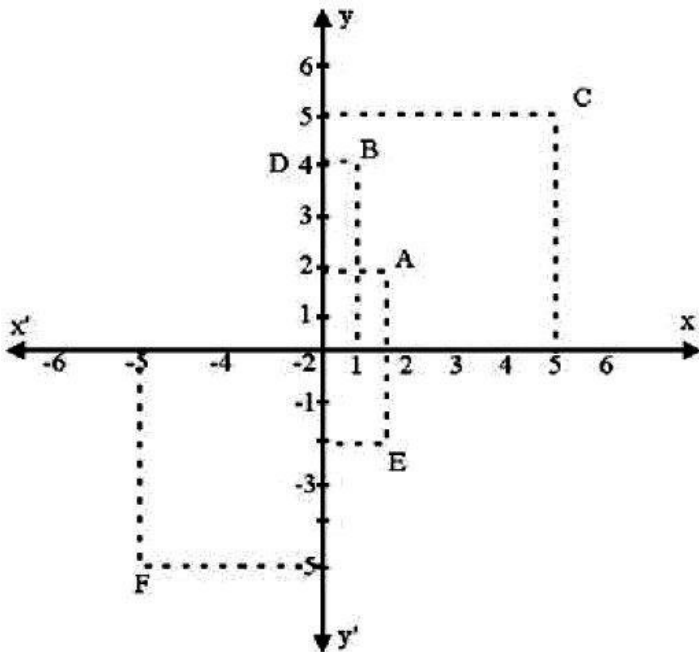
8. In adjoining figure, if $AC = BD$, then prove that $AB = CD$.

9. Find the value of k , if $x - 1$ is a factor of $4x^3 + 3x^2 - 4x + k$.

10. ΔABC is right angled in which $\angle A = 90^\circ$ and $AB = AC$. Find $\angle B$ and $\angle C$.

SECTION – C

11. 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



12. In the above right sided figure, if $PQ \perp PS$, $PQ \parallel SR$, $\angle SQR = 28^\circ$ and $\angle QRT = 65^\circ$, then find the values of x and y .

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

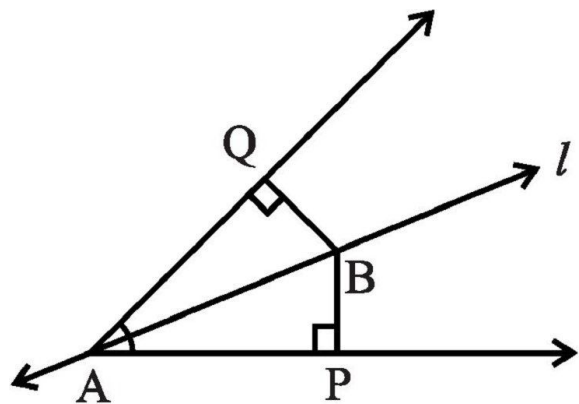
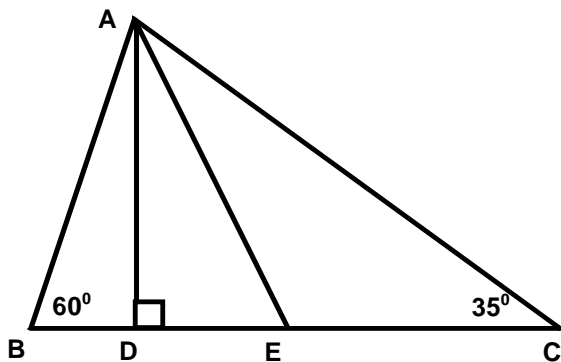
14. Find the value of a and b in $\frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}} = a + b\sqrt{3}$

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

16. Find the value of $x^3 + y^3 + 15xy - 125$ if $x + y = 5$.

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

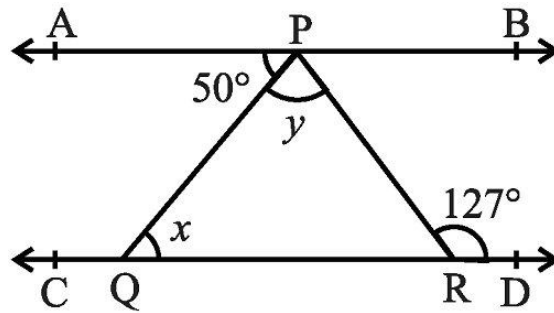
18. In given figure $AD \perp BC$, AE is the angle bisector of $\angle BAC$. Find $\angle DAE$



19. 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 above side figure). Show that:

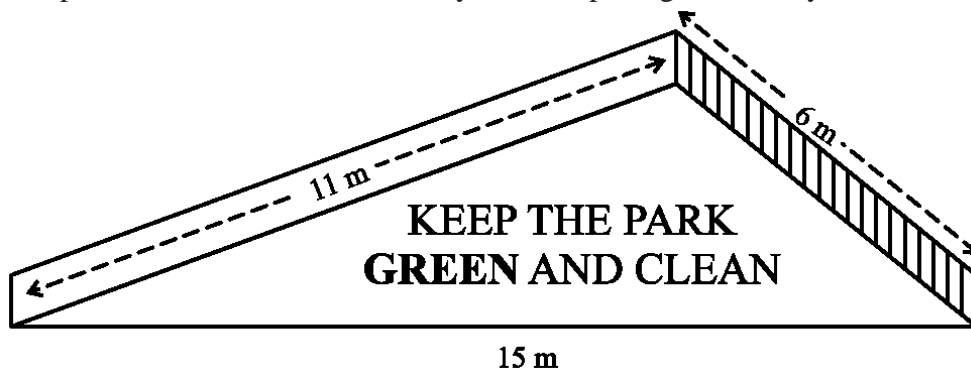
(i) $\triangle APB \cong \triangle AQB$ (ii) $BP = BQ$ or B is equidistant from the arms of $\angle A$.

20. In the below figure, if $AB \parallel CD$, $\angle APQ = 50^\circ$ and $\angle PRD = 127^\circ$, find x and y .

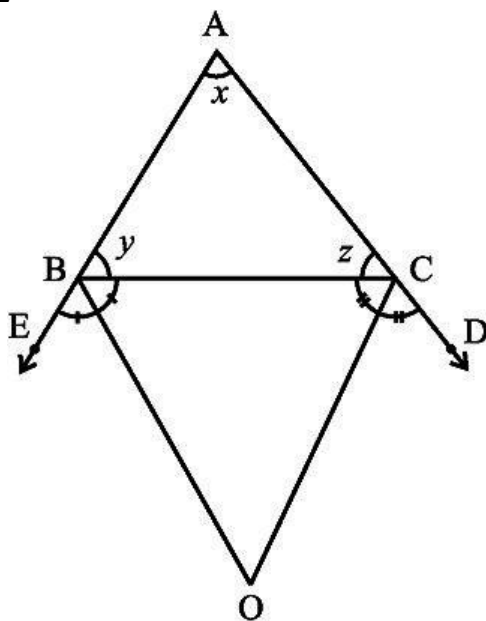


SECTION – D

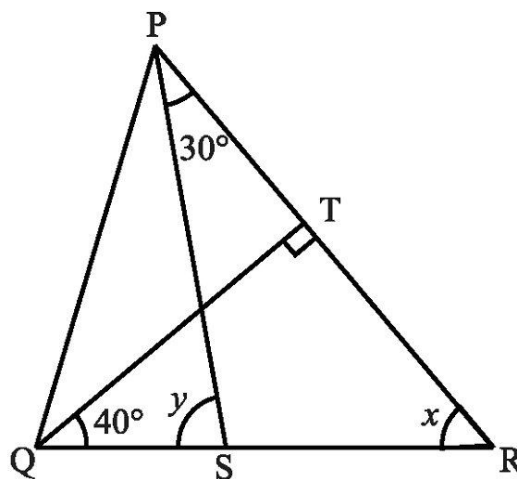
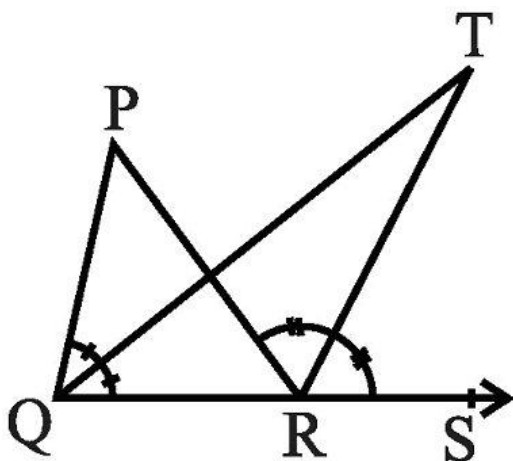
21. If $x = \frac{1}{2 - \sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$.
22. Prove that the sum of any two sides of a triangle is greater than twice the median drawn to the third side.
23. If polynomials $ax^3 + 3x^2 - 3$ and $2x^3 - 5x + a$ leaves the same remainder when each is divided by $x - 4$, find the value of a .
24. Factorise: $\left(\frac{1}{2}x - 3y\right)^3 + (3y - \sqrt{3}z)^3 + \left(\sqrt{3}z - \frac{1}{2}x\right)^3$
25. Simplify $\frac{4 + \sqrt{5}}{4 - \sqrt{5}} + \frac{4 - \sqrt{5}}{4 + \sqrt{5}}$ by rationalizing the denominator.
26. Find the value of a and b so that the polynomial $x^3 - 10x^2 + ax + b$ exactly divisible by $(x - 1)$ as well as $(x - 2)$.
27. 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
28. There is a slide in a park. One of its side walls has been painted in some colour with a message "KEEP THE PARK GREEN AND CLEAN". If the sides of the wall are 15 m, 11 m and 6 m, find the area painted in colour. What values you are depicting? Write any two values.



29. 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 $\angle CBE$ and $\angle BCD$ respectively meet at point O, then prove that $\angle BOC = 90^\circ - \frac{1}{2} \angle BAC$.



30. In the below figure, the side QR of $\triangle PQR$ is produced to a point S. If the bisectors of $\angle PQR$ and $\angle PRS$ meet at point T, then prove that $\angle QTR = \frac{1}{2} \angle QPR$.



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