

SUMMATIVE ASSESSMENT – I, 2014-2015
MATHEMATICS CLASS – IX

Time allowed : 3.15 hours

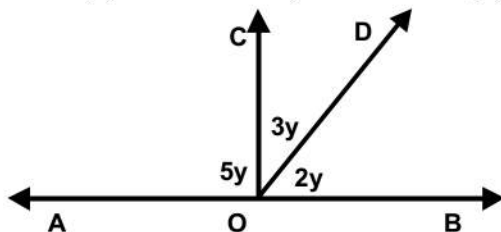
Maximum Marks : 90

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

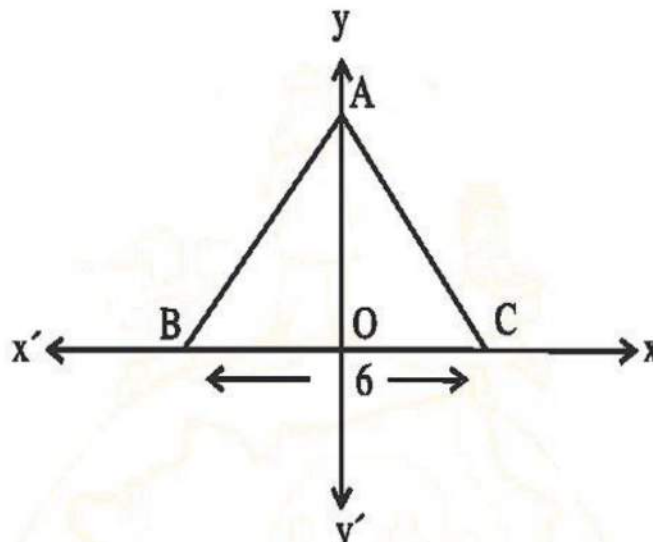
1. The value of $(\sqrt{5} + \sqrt{2})(\sqrt{5} - \sqrt{2})$ is:
(a) 10 (b) 7 (c) 3 (d) $\sqrt{3}$
2. On dividing $x^3 + 3x^2 + 3x + 1$ by $5 + 2x$ we get remainder:
(a) $\frac{8}{27}$ (b) $\frac{27}{8}$ (c) $-\frac{27}{8}$ (d) $-\frac{8}{27}$
3. In the fig. the value of y is:
(a) 16^0 (b) 10^0 (c) 15^0 (d) 18^0



4. If the area of an equilateral triangle is $36\sqrt{3}$ cm², then its perimeter is
(a) 64 cm (b) 60 cm (c) 36 cm (d) none of these

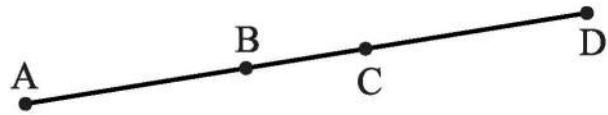
SECTION – B

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

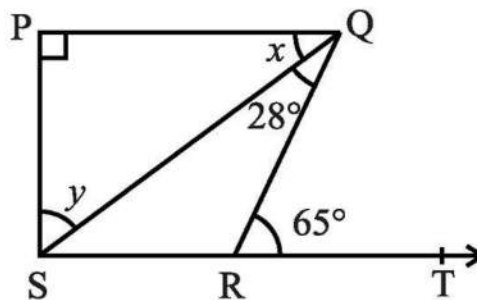
SECTION - C

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

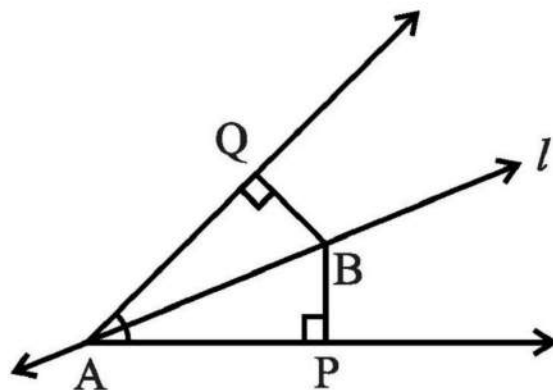
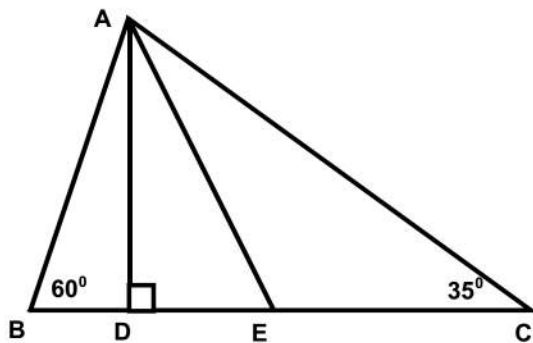
12. Find the value of a and b in $\frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}} = a + b\sqrt{3}$

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

14. In the below 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 .



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



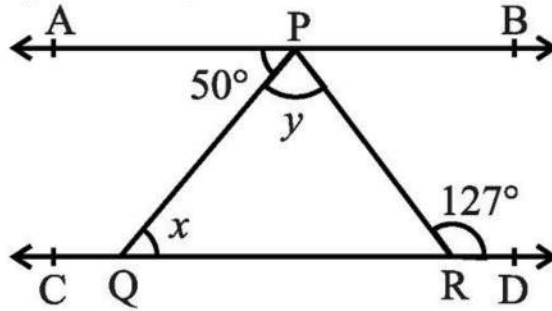
16. Line l is the bisector of an angle $\angle A$ and B is any point on l . BP and BQ are perpendiculars from B to the arms of $\angle A$ (see the above side figure). Show that:

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

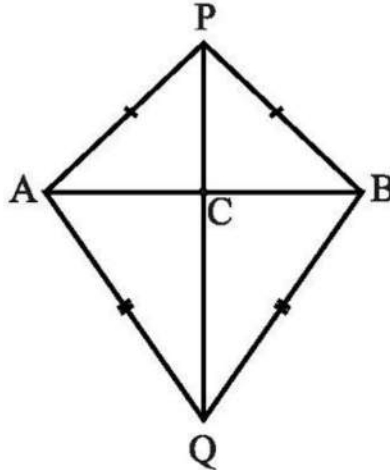
17. Prove that the sum of any two sides of a triangle is greater than twice the median drawn to the third side.

18. Find the integral zeroes of the polynomial $p(x) = 2x^3 + 5x^2 - 5x - 2$.

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

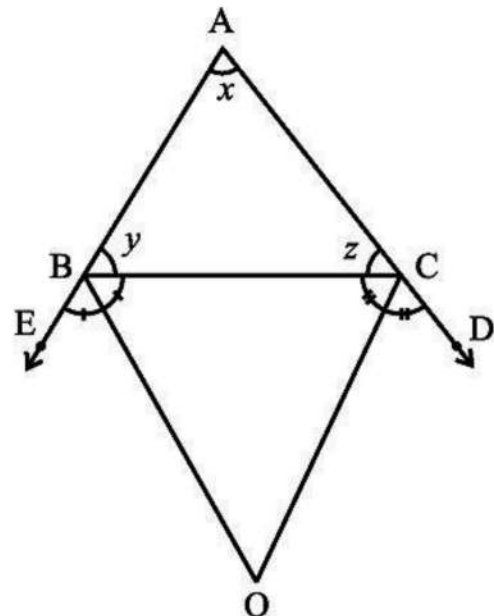
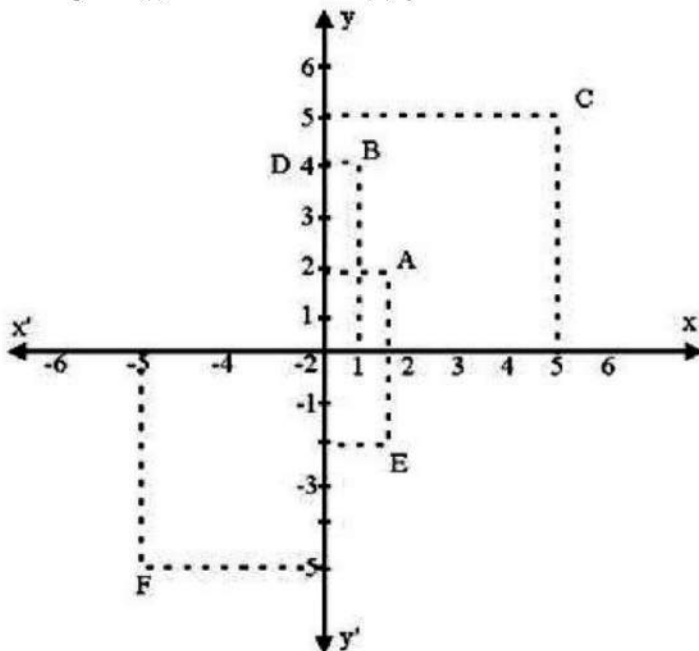


20. AB is a line-segment. P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B (see in the adjoining figure). Show that the line PQ is the perpendicular bisector of AB.



SECTION – D

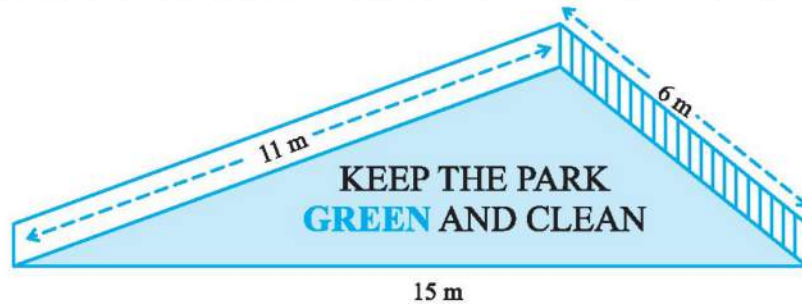
21. From the figure, find the coordinates of A, B, C, D, E and F. Which of the points are mirror image in (i) x – axis (ii) y – axis



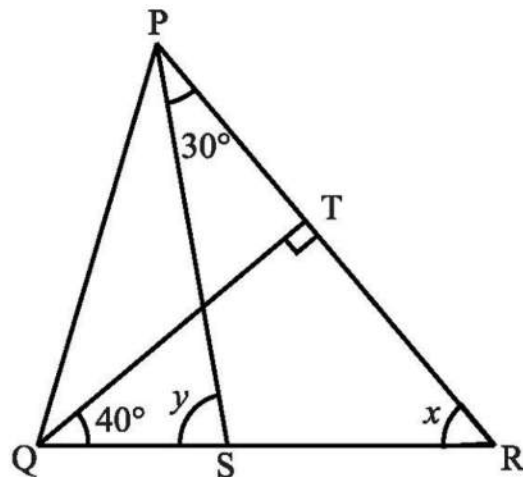
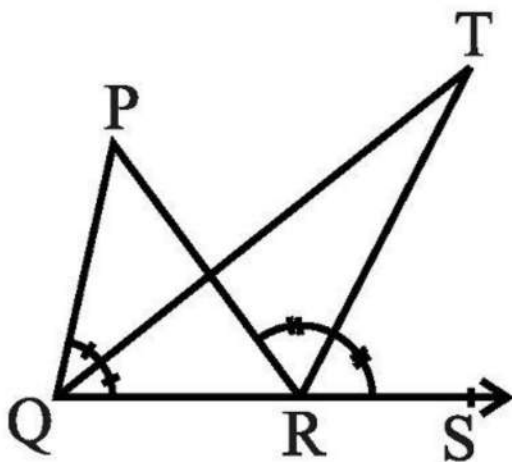
22. If $x = \frac{1}{2 - \sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$.

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: $\left(\frac{1}{2}x - 3y\right)^3 + \left(3y - \sqrt{3}z\right)^3 + \left(\sqrt{3}z - \frac{1}{2}x\right)^3$
25. Give possible expressions for the length and breadth of rectangles, in which its areas is given by $35y^2 + 13y - 12$
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. 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.



28. 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 $\angle BOC = 90^\circ - \frac{1}{2} \angle BAC$.
29. 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 $\angle QTR = \frac{1}{2} \angle QPR$.



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