

SUMMATIVE ASSESSMENT – I, 2015-16
 MATHEMATICS / Class – IX

Time Allowed : 3 hours

Maximum Marks: 90

General Instructions:

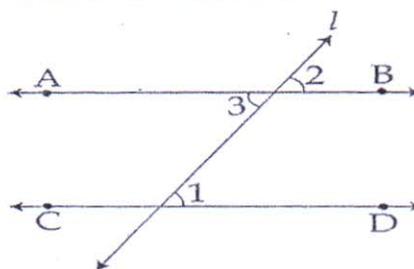
All questions are compulsory.

- 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.
- There is no overall choice in this question paper. Use of calculator is not permitted.

SECTION-A

Question numbers 1 to 4 carry one mark each.

- Simplify $\sqrt{10} \times \sqrt{15}$. 1
- If $2x + 1$ is one factor of the polynomial $2x^2 - x - 1$, then find the other factor. 1
- In the given figure, $AB \parallel CD$ and l is a transversal. 1
 If $\angle 1 = 70^\circ$, find $\angle 2$ and $\angle 3$.



- In which quadrant/axis does the point $(0, 4)$ lies? 1

SECTION-B

Question numbers 5 to 10 carry two marks each.

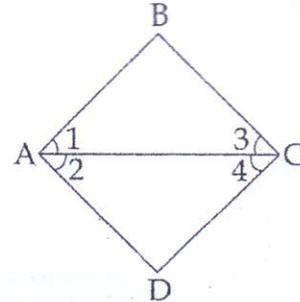
- Express -0.00875 in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$. 2
- Without actually calculating the cubes, find the value of: $(0.6)^3 + (0.7)^3 - (1.3)^3$ 2
- Prove that the sides opposite to equal angles of a triangle are equal. 2
- Solve the equation $x + 4 = 10$ and state Euclid's axiom used. 2
- Plot the points $A(3, 10)$, $B(-3, 5)$ and $C(-1, -6)$ on the graph paper. Join them in pairs and identify the figure so formed. 2
- Side of an equilateral triangle is 16 m. Find its area. (Use $\sqrt{3} = 1.732$). 2

SECTION-C

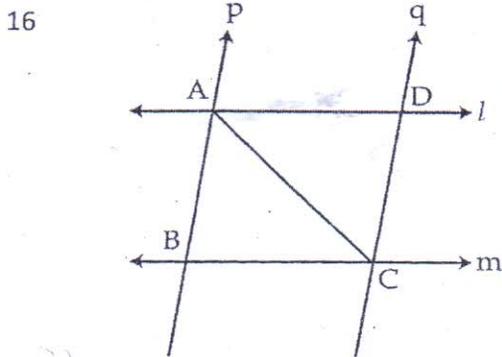
Question numbers 11 to 20 carry three marks each.

- Show that: $\frac{x^{-1} + y^{-1}}{x^{-1}} + \frac{x^{-1} - y^{-1}}{y^{-1}} = \frac{x^2 + y^2}{xy}$ 3
- Rationalise the denominator of $\frac{4}{2 + \sqrt{3} + \sqrt{7}}$ 3
- If $a - b = 7$ and $a^2 + b^2 = 85$, find $a^3 - b^3$. 3
- Factorise: $27x^3 - (3x - y)^3$ 3

- 15 In the given figure, $\angle 1 = \angle 2$ and $\angle 2 = \angle 3$. Show that $\angle 1 = \angle 3$.
State the Euclid axiom used.



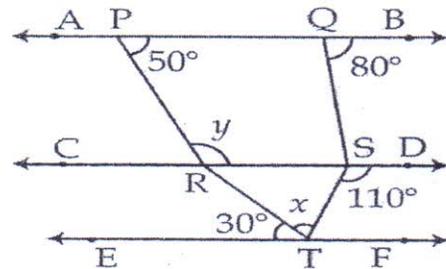
3



l and m are two parallel lines intersected by another pair of parallel lines p and q as shown in the figure.
Show that $\triangle ABC \cong \triangle CDA$.

3

- 17 In the given figure, if $AB \parallel CD \parallel EF$, find the value of $(y-x) : (y+x)$:



3

- 18 If a transversal intersects two parallel lines, then prove that bisectors of alternate interior angles are parallel. 3
- 19 What are the names of horizontal and vertical lines drawn to determine the position of any point in the cartesian plane? What is their point of intersection called? How many parts of the coordinate plane are formed by these two lines and what are they called? 3
- 20 Find the area of an isosceles triangle having unequal side as 12 cm and each of the equal sides as 24 cm. Also, find its altitude corresponding to the unequal side. 3

SECTION-D



Question numbers 21 to 31 carry four marks each.

21

Represent $\sqrt{13}$ on number line geometrically. Verify using mathematically.

4

- 22 Rationalize the denominator of $\frac{\sqrt{6} + \sqrt{3}}{\sqrt{6} - \sqrt{3}}$ and hence find its value, if $\sqrt{2} = 1.414$.

4

- 23 Divide the polynomial $x^4 + 3x^3 - 2x^2 + x + 10$ by $x + 2$ and verify remainder by using remainder theorem. 4

- 24 Verify if 1 and -3 are zeroes of the polynomial $3x^3 + 5x^2 - 11x + 3$. If yes, then factorise the polynomial. 4

- 25 If $(x + a)$ is a factor of each of the polynomials $x^2 + px + q$ and $x^2 + mx + n$, prove that $a = \frac{n - q}{m - p}$. 4

- 26 Prove that $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2) = 8y^3$. 4

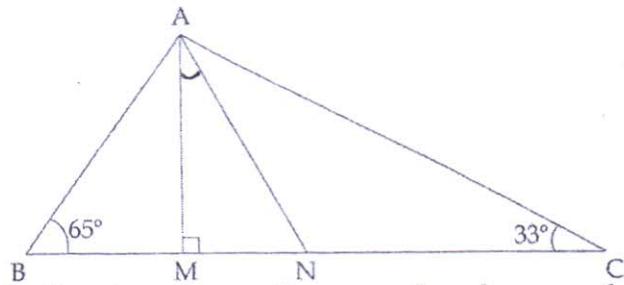
27 For spreading the message "Save environment Save Future" a rally was organized by some students of a school. They were given triangular cardboard piece ABC which they divided in to two parts by drawing the angle bisectors BO and CO of base angles B and C. Prove that

$$\angle BOC = 90 + \frac{1}{2} \angle A.$$

What is the benefit of these types of rallies?

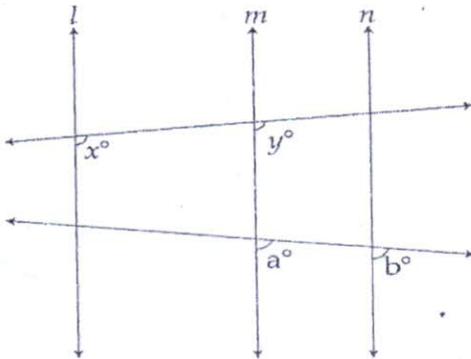
28

In the given figure, AM is perpendicular to BC and AN is the bisector of $\angle BAC$. If $\angle B = 65^\circ$ and $\angle C = 33^\circ$, find $\angle MAN$.



In the given figure, if $x = y$ and $a = b$, prove that l is parallel to n .

29



30 Prove that the sum of three angles of a triangle is two right angles. If in a right angled triangle an acute angle is one-fourth the other, find the acute angles.

31

ABC and DBC are two isosceles triangles on the same base BC and vertices A and D on the same side of BC. AD is extended to intersect BC at P, show that

- (i) $\triangle ABD \cong \triangle ACD$
- (ii) AP is perpendicular bisector of BC.

