MANAV BHARTI

A.

5A0DRLU

SET-I

SUMMATIVE ASSESSMENT – I, 2014
MATHEMATICS
Class – IX

Time Allowed: 3 hours **Maximum Marks: 90**

General Instructions:

1. All questions are **compulsory**.
2. 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.
3. There is no overall choice in this question paper.
4. Use of calculator is not permitted.

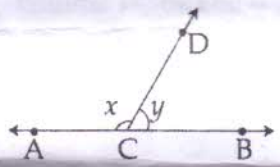
SECTION-A

Question numbers **1** to **4** carry one mark each

1 Find the value of $(256)^{0.16} \times (256)^{0.09}$. 1

2 Factorise : $x^2 - 16$ 1

3 In the figure, if ACB is a straight line and $x : y = 2 : 1$, find the values of x and y 1



4 Name the mathematician who initiated the development of coordinate geometry. 1

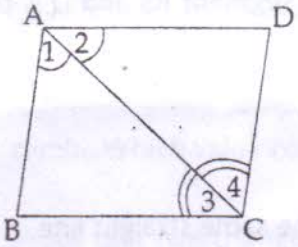
SECTION-B

Question numbers **5** to **10** carry two marks each.

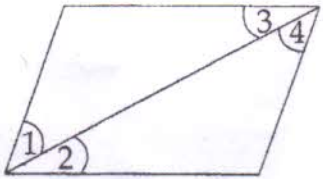
5 Simplify: $\left(5+\sqrt{5}\right)\left(3+\sqrt{3}\right)^2$ 2

6 Check whether $7+3x$ is a factor of $3x^2+7x$. 2

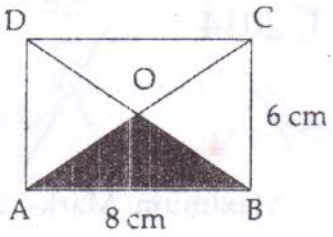
7 In the given figure, if $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$, then prove that BC = CD. 2



8 In the given figure; if $\angle 1 = \angle 3$, $\angle 2 = \angle 4$ and $\angle 3 = \angle 4$, write the relation between $\angle 1$ and $\angle 2$ by using an Euclid's axiom. Write the axiom. 2



9 In the given figure, ABCD is rectangle in which AB = 8 cm, BC = 6 cm and the diagonals intersect each other at O. Find the area of the shaded region by using Heron's formula. 2



10 Given a point X(0, 6), plot two points Y and Z on the graph paper so that XYZ is an isosceles triangle. 2

SECTION-C

Question numbers **11** to **20** carry three marks each.

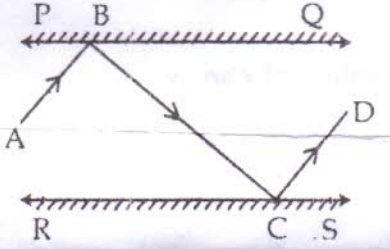
11 Find the values of a and b , if $\frac{3+\sqrt{2}}{3-\sqrt{2}} - \frac{3-\sqrt{2}}{3+\sqrt{2}} = a + 12\frac{\sqrt{2}}{7}b$ 3

12 Represent $\sqrt{10.5}$ on the number line. 3

13 Divide the polynomial $4x^4 - 4x^3 + 3x^2 + 7x - 2$ by $2x - 1$ and find quotient and remainder. 3

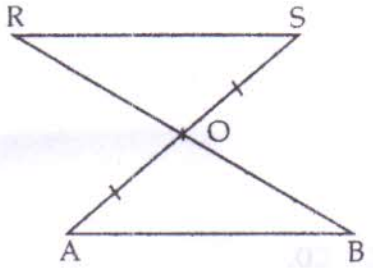
14 If one factor of the polynomial $6x^3 - 13x^2 - 14x - 3$ is $2x + 1$, then completely factorise the polynomials. 3

15 3



In figure PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that $AB \| CD$.

16 3



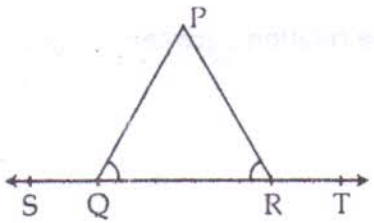
In the given figure if the line segment AB is parallel to another line segment RS and O is the mid-point of AS then, Show that :

(i) $\Delta AOB \cong \Delta SOR$

(ii) O is also mid-point of BR

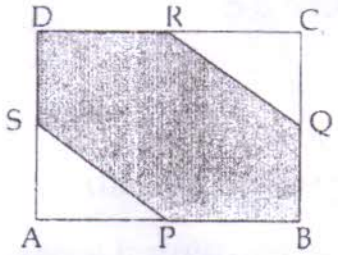
17 Prove that the bisectors of pairs of vertically opposite angles are in the same straight line. 3

18 3



In the figure, $\angle PQR = \angle PRQ$, then prove that $\angle PQS = \angle PRT$.

19 In the figure, ABCD is a rectangle of sides 8 m and 4 m. P, Q, R and S are mid-points of AB, BC, CD and DA respectively. Find the area of the shaded region. 3



20 Three vertices of rectangle are (3, 2), (−4, 2) and (−4, 5). Plot these points and find the co-ordinates of the fourth vertex. 3

SECTION-D

Question numbers **21** to **31** carry four marks each.

21 Find a and b if $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + \sqrt{5}b$. 4

22 If $x = 3 + \sqrt{8}$, find the value of $x^2 + \frac{1}{x^2}$. 4

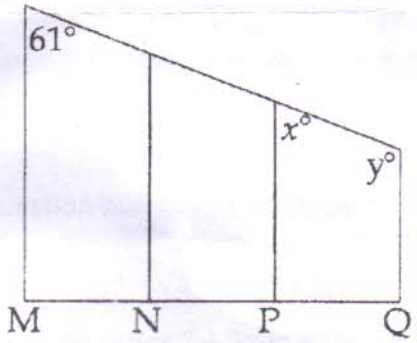
23 If $x + \frac{1}{x} = 6$, find the value of $x^4 + \frac{1}{x^4}$. 4

24 Factorise: $2y^3 + y^2 - 2y - 1$ 4

25 What are the possible expressions for the dimensions of a cuboid, whose volume $= 36kx^2y - 21kxy^2 + 3ky^3$? 4

26 Factorise: $2x^3 + 7x^2 - 3x - 18$ 4

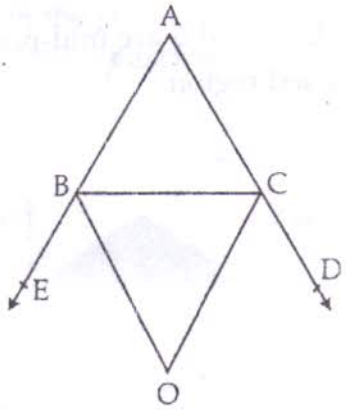
27



4

This figure shows parallel stair railings through points M, N, P and Q.
What is the value of *x*?
Also find value of *y*?
A college made ramp instead of stairs to make it easy for physically challenged students to climb. Which value college is exhibiting by placing ramps instead of stairs?

28 Prove that two triangles are congruent if any two angles and the included side of one triangle is equal to any two angles and the included side of the other triangle. 4

29 

4

In figure, the sides AB and AC of ΔABC are produced to points E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at a point O, then prove that $\angle BOC = 90° - \frac{1}{2}\angle BAC$

30 Two sides AB and BC and median AM of ΔABC are respectively equal to sides PQ, QR and median PN of ΔPQR then prove that $\Delta ABC \cong \Delta PQR$ 4

31 Prove that sum of the angles of a triangle is 180°. If in ΔABC, $\angle A + \angle B = 120°$ and $\angle B + \angle C = 100°$, then find $\angle B$. 4