(NGFS)

9089

RJHI2UI

SUMMATIVE ASSESSMENT – I, 2016-17
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.
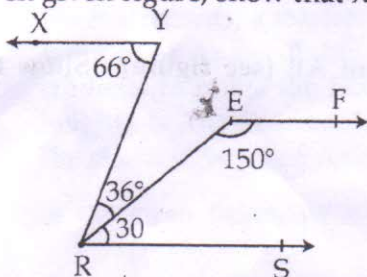
SECTION-A

Question numbers 1 to 4 carry one mark each.

1   Find the value of $(81)^{0.16} \times (81)^{0.09}$ 1

2   Using appropriate identity, factorize $9x^2 + 6x + 1$.   1

3   Is it possible that two angles of a triangle are obtuse ?   1

4   Find the coordinates of the point P (a, b) whose ordinate is twice as much as abscissa and   1
sum of the coordinates is -12.

SECTION-B

Question numbers 5 to 10 carry two marks each.

5   Express $3\frac{4}{5}$ in the decimal form and state the kind of decimal expansion.   2

6   Find the value of k, if $x - 3$ is a factor of $p(x) = kx^2 - x - 15$.   2

7   Prove that an equilateral triangle can be constructed on any given line segment.   2

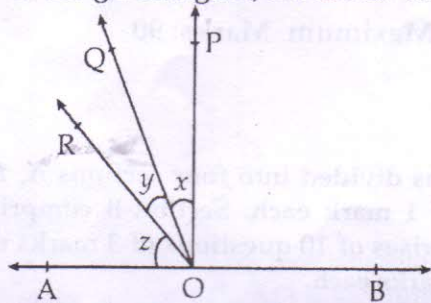8   In given figure, show that XY∥EF :   2

9   Plot reflection of A(3, -6) in x - axis as point B and then plot the reflection of B in y - axis.   2

10 Suman has a piece of land, which is in the shape of a rhombus. She wants her two   2
daughters to work on the land and produce different crops. She divides the land in two
equal parts by drawing a diagonal. If its perimeter is 400 m and one of the diagonals is of
length 120 m, how much area each of them will get for his crops ?

SECTION-C

Question numbers 11 to 20 carry three marks each.
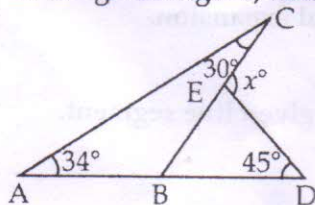
11 Represent $\sqrt{4.2}$ on the number line.   3

12 If $\dfrac{5+\sqrt{11}}{3-2\sqrt{11}} = x + y\sqrt{11}$, find the values of x and y. 3

13 Prove that $9x^2 + 30x + 28$ has no zeroes. 3

14 Find the value of $a^3 + b^3 + 6ab - 8$, when $a + b = 2$. 3

15 In the given figure, PO $\perp$ AB. If $x:y:z = 1:3:5$, then find the measures of x, y and z. 3

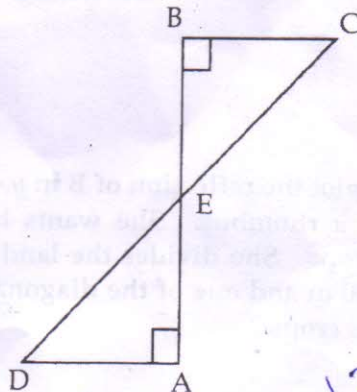**16** In the given figure, show that AB∥CD : 3
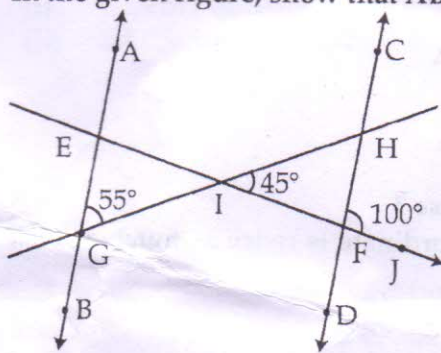
17 In the given figure, find the value of x : 3

**18** AD and BC are equal perpendiculars to a line segment AB (see figure). Show that CD bisects AB. 3

19 Plot the points (x, y) given in the following table on the cartesian plane, choosing suitable units of distances on the axes :

x	10	−5	0	12	−6	5
y	5	15	−8	−10	−8	0

20 A floor design on a floor of a room is made up of 8 triangular tiles as shown in the figure, the sides of the triangle being 15 cm, 5 cm and 12 cm. Find the cost of polishing the tiles at the rate of ₹ 1.50 per cm². (Use $\sqrt{11} = 3.3$)   3
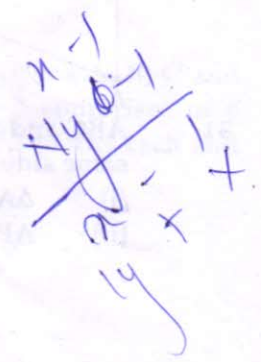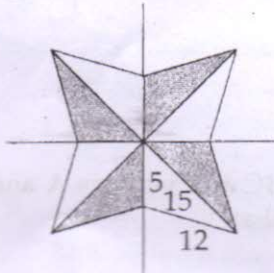
SECTION-D

Question numbers 21 to 31 carry four marks each.

21 If $x = \dfrac{\sqrt{5}+1}{\sqrt{5}-1}$ and $y = \dfrac{\sqrt{5}-1}{\sqrt{5}+1}$, then find the value of $x^2 + y^2$ 4

22 simplify : $\left(\sqrt{x}\right)^{\frac{-2}{3}} \sqrt{y^4} \div \sqrt{xy^{-1}}^{\,2}$ 4

23 Show that $x+2$ is a factor of the polynomial $2x^3 + 4x^2 - 3x - 6$. Hence factorise the polynomial.   4

24 Find the quotient when $f(x) = x^3 + 3x^2 + 3x + 5$ is divided by $g(x) = x + 2$. Also, find the remainder.   4

**25** Factorise : $2y^3 + y^2 - 2y - 1$ 4

26 If $a+b+c=0$, then prove that $\dfrac{(b+c)^2}{3bc} + \dfrac{(c+a)^2}{3ac} + \dfrac{(a+b)^2}{3ab} = 1$ 4

27 For her records, a teacher asked the students about their heights. Mayank said his height is same as of Anav. Rahul said that his height is same as that of Anav. She then asked the students to relate the height of Mayank and Rahul. Anav answered, they both have same height. Is Anav correct ? If yes, state Euclid's Axiom which support your answer. What are the characteristics of Anav nature ?   4
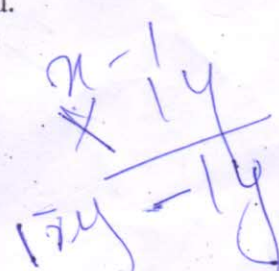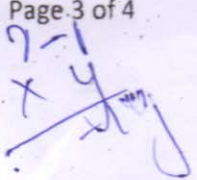
28 In the given figure, AB = CD, P and Q are points on AB and CD such that $AP = \dfrac{1}{3} AB$ and $CQ = \dfrac{1}{3} CD$. Show that AP = CQ. State which axiom you use here. Also give two more axioms other than the axiom used in the above situation.   4
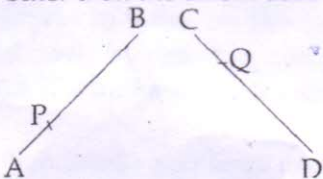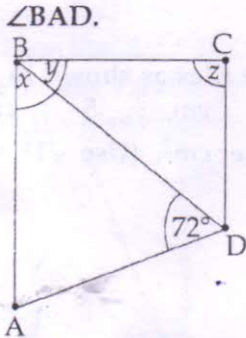

29 If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.   4

30   In the given figure, AB is parallel to DC. If $x = \dfrac{4}{3}\,y$ and $y = \dfrac{3}{8}\,z$, find $\angle BCD$, $\angle ABC$ and   4

$\angle BAD$.

31   ABC and DBC are two isosceles triangle on the same base BC and vertices A and D on the   4
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.

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$$16\left(16 - 1\right)\left(16 - 15\right)\left(16 - 3\right)$$

$$\frac{\sqrt{16 \times 15 \times 1 \times 13}}{\sqrt{2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 13}}$$

$$= \quad 195\sqrt{4}.$$

$$\begin{array}{r} 3.8 \\ 5\overline{)19} \\ 15 \\ \underline{} \\ 40 \end{array}$$

$$\begin{array}{r} \frac{y}{6} \\ \times\ 3 \\ \hline 195 \end{array}$$