St. Paul

PGL51FW

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. If $x^{1/12} = 49^{\frac{1}{24}}$, then find the value of x.   1

2. Factorise : $8y^3 - 125x^3$.   1

3. Is $\triangle ABC$ possible, if $\angle A = 60°$, $\angle B = 80°$ and $\angle C = 40°$?   1

4. Find the area of an equilateral triangle of side 8 cm.   1

SECTION-B

Question numbers 5 to 10 carry two marks each.

5. Find two rational numbers between   2

   $0.121221222122221....$ and $0.141441444...$ in the $\dfrac{P}{q}$ form, where p and q are integers and $q \neq 0$

6. Find the value of m, if $x + 2$ is a factor of $2x^4 + mx + 4$.   2

7. State any two of Euclid's five postulates.   2

8. In the figure $l \| m$. If $\angle P = 90°$, $\angle RQP = 40°$ and $\angle PQS = 20°$, then find $\angle R$ and $\angle S$.   2
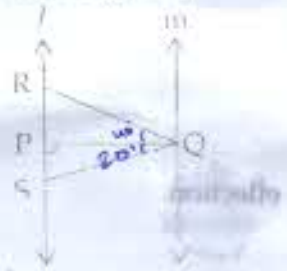
9. On y-axis, plot four points such that distances between two consecutive points are equal.   2

10. Side of an equilateral triangle is 16 m. Find its area using Heron's formula. (Use $\sqrt{3} = 1.732$).   2
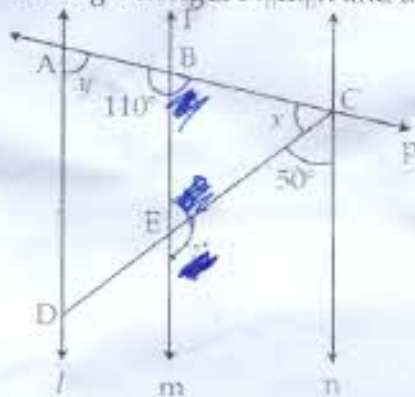
SECTION-C

Question numbers 11 to 20 carry three marks each.

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

12. Find the values of a and b, if $\dfrac{\sqrt{2} + 1}{\sqrt{2} - 1} - \dfrac{\sqrt{2} - 1}{\sqrt{2} + 1} = a + \sqrt{2}\, b$ 3
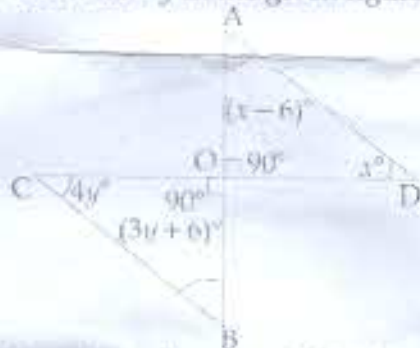
13   If $x - y = 9$ and $xy = 2$, find the value of $x^3 - y^3$.

14   If $x^2 + y^2 = 20$ and $x + y = 6$, then find the value of $x^3 + y^3$.

15   Three lines AB, CD and EF meet at a point O, forming angles as shown in the figure. Find the values of x, y, z and u.
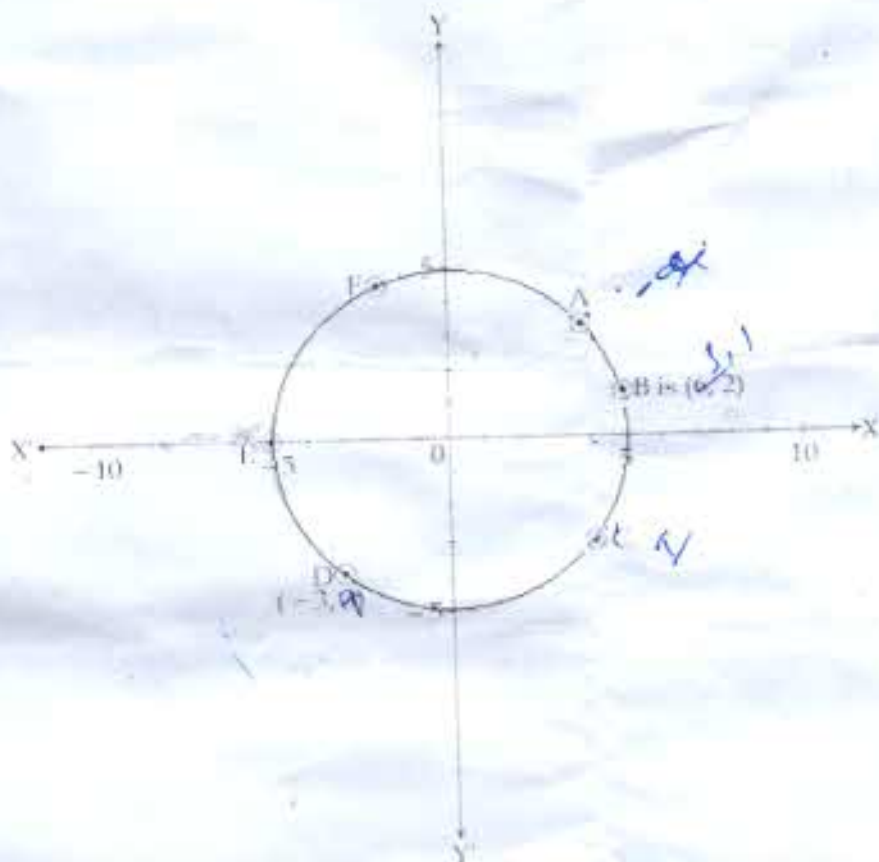

16   In the given figure $l \| m \| n$ and a transversal p intersects them. Find the values of x, y and z.   3

17   Find x and y in the given figure.   3

18   In an isosceles triangle LMN, LM = LN and MP and NQ are two medians. Show that MP = NQ.   3

19   From the graph, write the coordinates of points A, B, C, D. E and F. Give the point of reflection   3
   of A in y-axis. Also, give point of reflection of C in x-axis.

20. In a rectangular field of dimensions 50 m × 30 m, a triangular park is constructed. If the dimensions of the park are 14 m, 15 m and 13 m, find the area of the remaining field. **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. If $\dfrac{9^{n+1} \times \left(3^{-n/2}\right)^{-2} - 27^n}{\left(3^m \times 2\right)^3} = \dfrac{1}{729}$ and $m + n = 5$; find the values of m and n. **4**

23. Find the value of the polynomial $p(x) = x^4 - 4x^3 + 3x^2 - 1$ at $x = 1, -\dfrac{1}{3}, \dfrac{1}{2}$ and -2. **4**

24. Using long division method, show that the polynomial $p(x) = x^3 + 1$ is divisible by $q(x) = x + 1$. Verify your result using factor theorem. **4**

25. factorise : $2y^3 - 11y^2 + 17y - 6$ **4**

26. If $3a - 2b + 5c = 5$ and $6ab + 10bc - 15ac = 14$, find the value of : $27a^3 + 125c^3 + 90abc - 8b^3$. **4**

27. Teacher held two sticks AB and CD of equal length in her hands and marked their mid-points M and N respectively. She then asked the students whether AM is equal to ND or not. Arpita answered yes. Is Arpita correct ? State axiom of Euclid's that support her answer. Which characteristics of Arpita you want to inculcate in your nature ? **4**
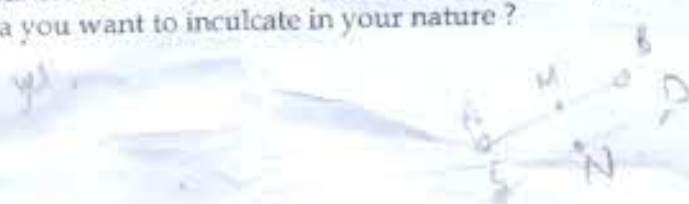
28 In the given figure, AB = CD, P and Q are points on AB and CD such that $AP = \frac{1}{3} AB$ and $CQ = \frac{1}{3} CD$. Show that AP = CQ. State which axiom you use here. Also give two more axioms other than the axiom used in the above situation. 4
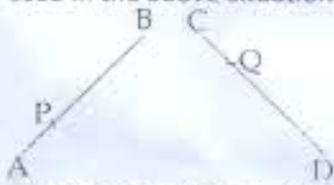
29 In the given figure, $\angle ABC = 30°$, $\angle EDF = (40 - x)°$ and $\angle ADE = (13x + 20)°$. Show that BC is parallel to DE : 4

30 Prove that sum of angles of a quadrilateral is 360°. Using this result, find the angles of a quadrilateral, if they are in the ratio 4 : 6 : 3 : 5 4

31 ABC and DBC are two isosceles triangle on the same base BC such that A and D lies on the opposite sides of BC. Show that AD is the perpendicular bisector of BC. 4

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