

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

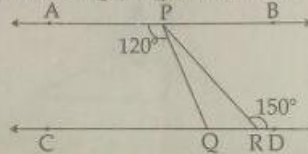
Question numbers 1 to 4 carry one mark each.

1. Simplify $(\sqrt{x^3})^{\frac{2}{3}}$ 1
2. Factorise : $125x^3 + y^3$. 1
3. The measures $(30 - a)^\circ$ and $(125 + 2a)^\circ$ of two angles are supplement of each other. Find the value of a. 1
4. If the area of a parallelogram is 64 cm^2 , base is 12 cm, then find the altitude of the parallelogram. 1

SECTION-B

Question numbers 5 to 10 carry two marks each.

5. Express 0.00875 in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$. 2
6. Determine whether $3x - 2$ is a factor of $3x^3 + x^2 - 20x + 12$. 2
7. State playfair's axiom. Is it equivalent to one of the Euclid's postulate. 2
8. In given figure $AB \parallel CD$. Determine $\angle PQR$, $\angle QPR$ and $\angle RPB$. 2



9. A point lies on x-axis at a distance of 5 units from y-axis. What are its co-ordinates? What will be its co-ordinates, if it lies on y-axis at a distance of 5 units from x-axis? 2
10. The semiperimeter of a triangle is 132 cm and the product of the differences of semi-perimeter and its respective sides (in cm) is 13200. Find the area of the triangle. 2

$$132 - (x + y + z) = 13200$$

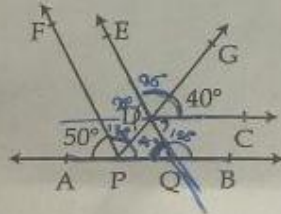
$$2xy + 2z = 10$$



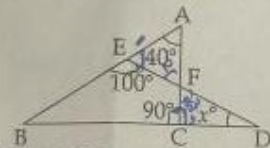
SECTION-C

Question numbers 11 to 20 carry three marks each.

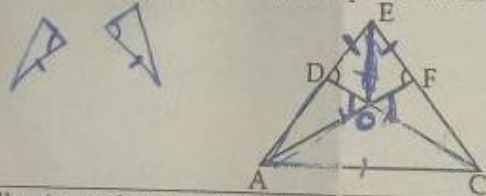
- 11 Simplify: $\frac{\sqrt{72}}{5\sqrt{72} + 3\sqrt{288} - 2\sqrt{648}}$ 3
- 12 Rationalise the denominator of $\frac{y^2}{\sqrt{x^2 + y^2} + x}$ 3
- 13 Find the value of $27x^3 + 8y^3$ if $3x + 2y = 14$ and $xy = 8$. 3
 Evaluate 111^3 , using a suitable identity. 3
 Prove that the bisectors of pairs of vertically opposite angles are in the same straight line. 3
- 16 In the figure, $AB \parallel CD$ and $DE \parallel PF$. If $\angle APF = 50^\circ$ and $\angle CDG = 40^\circ$, find (i) $\angle AQD$ (ii) $\angle EDG$ and (iii) $\angle DPF$. 3



17 In the given figure, find x .



18 In the figure, if $AF = CD$ and $\angle AFE = \angle CDE$, prove that $EF = ED$.



19 Plot the following ordered pairs (x, y) of numbers as points in the cartesian plane:

x	0	-4.5	-1	2	-3	4
y	2.5	0	3	5	-2	-6

20 If two diagonals of a rhombus are of lengths 90 m and 400 m, then find the height and perimeter of the rhombus.

SECTION-D

Question numbers 21 to 31 carry four marks each.

21 If $a = \frac{\sqrt{5} + \sqrt{10}}{\sqrt{10} - \sqrt{5}}$ and $b = \frac{\sqrt{10} - \sqrt{5}}{\sqrt{10} + \sqrt{5}}$, then show that $\sqrt{a} - \sqrt{b} - 2\sqrt{ab} = 0$.

$12000 \div \frac{1}{2} \times 20\sqrt{77}$

$5\sqrt{77}, \frac{1800}{\sqrt{77}}$

$45 \times 45 = 2025$
 $2025 \times 2 = 4050$
 $4050 \times 2 = 8100$
 $8100 \times 2 = 16200$

$45 \times 45 = 2025$
 $2025 \times 2 = 4050$
 $4050 \times 2 = 8100$
 $8100 \times 2 = 16200$

22 Simplify: $\left(\frac{81}{16}\right)^{\frac{3}{4}} \times \left[\left(\frac{25}{9}\right)^{\frac{-3}{2}} + \left(\frac{5}{2}\right)^{-3}\right]$

23 Find the values of p and q so that $(x+1)$ and $(x-1)$ are the factors of the polynomial $x^4 + px^3 + 2x^2 - 3x + q$.

24 Show by long division that $2x+3$ is a factor of $p(x) = 4x^4 + 8x^3 + 5x^2 + x - 3$.

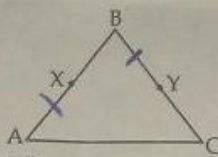
25 Factorise: $27p^3(4q-2r)^3 + 64q^3(2r-3p)^3 + 8r^3(3p-4q)^3$

26 If $f(x) = x^2 - 5x + 7$, evaluate $f(2) - f(-1) + f\left(\frac{1}{3}\right)$.

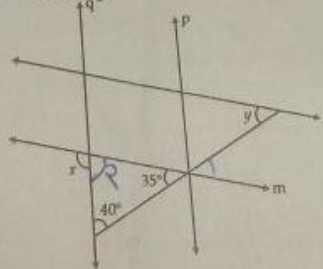
27 In figure, a plot is in the form of a parallelogram ABCD. Owner of this plot wants to build OLD AGE HOME, DISPENSARY, PARK and HEALTH CENTRE for elderly people as shown in the fig. P is a point on the diagonal BD such that DP is half of DB and PB is also half of DB. What is the relation between DP and PB? Which Euclid Axiom supports the answer? State the value exhibited by the owner of plot.



28 In the given figure, we have X and Y are the mid-points of AB and BC and $AX = BY$. Show that $AB = BC$. State which axiom you use here. Also give two more axioms other than the axiom used in the above situation.

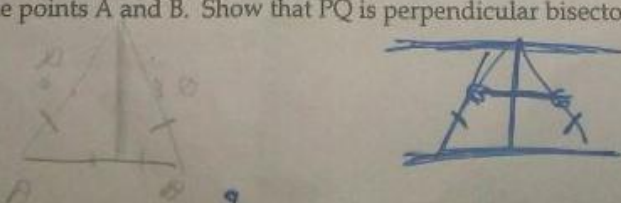


29 In the figure, find x and y, if $l \parallel m$ and $p \parallel q$.



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

31 AB is a line-segment and P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B. Show that PQ is perpendicular bisector of AB.



Handwritten notes: $\frac{10}{10} \times \frac{10}{10}$, $\frac{10}{10} \times \frac{10}{10}$, $\frac{10}{10} \times \frac{10}{10}$, $\frac{10}{10} \times \frac{10}{10}$, $\frac{10}{10} \times \frac{10}{10}$, $\frac{10}{10} \times \frac{10}{10}$

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