Summative Assessment-I
Topper Sample Paper - 10
MATHEMATICS
CLASS IX

Time: 3 to $3\frac{1}{2}$ hours Maximum Marks: 80

GENERAL INSTRUCTIONS:

1. All questions are compulsory.
2. The question paper is divided into four sections

   Section A: 8 questions (1 mark each)

   Section B: 6 questions (2 marks each)

   Section C: 10 questions (3 marks each)

   Section D: 10 questions (4 marks each)
3. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks and 2 questions of four marks each.
4. Use of calculators is not allowed.

SECTION – A

Q1.Which of the following is an irrational number?

(A) $(\sqrt{5})^2$

(B) $(\sqrt{5}-1)+(1-\sqrt{5})$

(C) $\frac{\sqrt{5}}{\sqrt{5}}$

(D) $\sqrt{\sqrt{25}}$

Q2.Evaluate: $5^3 - 2^3 - 3^3$

(A) 60

(B) 90

(C) 120

(D) 90

Q.3 An exterior angle of a triangle is 80° and two interior opposite angles are equal. Measure of each of these angle is:

(A) 120° (B) 40° (C) 100° (D) 60°

Q4. The sides of a scalene triangle are in the ratio 3:5:7. If the perimeter of the triangle is 60 cm , then its area is :

(A) 40 sq cm
(B) $60\sqrt{3}$ sq cm
(C) $160\sqrt{3}$ sq cm
(D) $480\sqrt{19}$ sq cm

Q.5 In figure -1, value of x is:

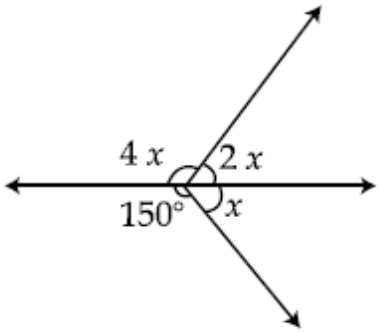

Figure - 1

(A) 20° (B) 40° (C) 30° (D) 50°

Q.6 Heron's formula is:

(A) $\Delta = \sqrt{s(s+a)(s+b)(s+c}$

(B) $\Delta = \sqrt{(s-a)(s-b)(s-c)}$

(C) $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$, s = a + b + c

(D) $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$, 2 s = a + b + c

Q.7 Zero of the polynomial p (x) where p (x) = ax, $a \neq 0$ is :

(A) 1 (B) a (C) 0 (D) $\frac{1}{a}$

Q.8 If p (x) =2 + $\frac{x}{2} + x^2 - \frac{x^3}{3}$ then p (-1) is :

(A) $\frac{15}{6}$ (B) $\frac{17}{6}$ (C) $\frac{1}{6}$ (D) $\frac{13}{6}$

SECTION –B

Q.9 Express $2.\overline{9.3}$ in the form of $\frac{p}{q}$ where p and q are integers and q ≠ o.

Q.10 If $x = 3 + 2\sqrt{2}$ then find the value of $\left(x - \frac{1}{x}\right)^3$.

Q.11 If $2x + 3y = 8$ and $xy = 4$ then find the value of $4x^2 + 9y^2$.

OR

If $x^2 + \frac{1}{x^2} = 38$, then find the value of $\left(x - \frac{1}{x}\right)$.

Q.12 In figure -2, lines AB and CD intersect at O. If ∠AOD: ∠DOC= 4:5 then find ∠COB.

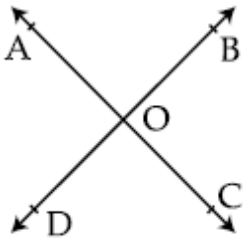

Figure - 2

Q.13 In figure -3 if PQ||RS then find ∠SOR

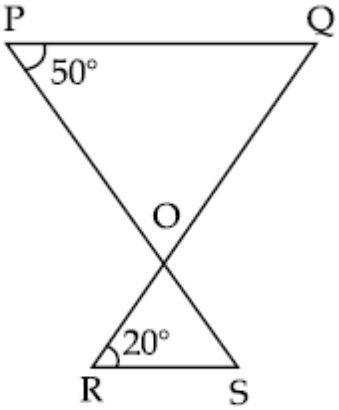

Figure - 3

Q.14 In figure -4, ΔABC and ΔABD are equilateral triangles. Find coordinates of point C and D.

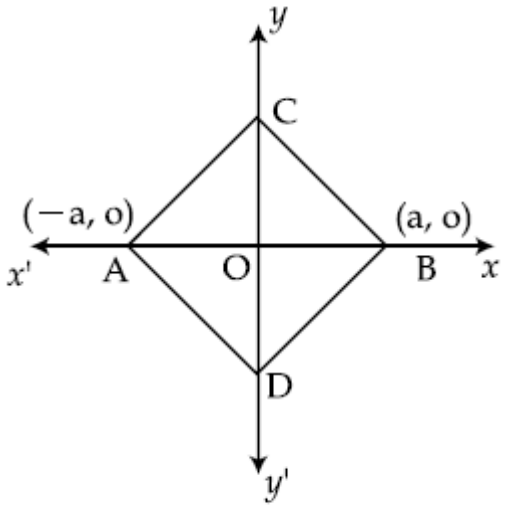

Figure - 4

SECTION - C

Q.15 If $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a + b\sqrt{3}$ then find the value of a and b.

OR

Simplify: $\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{2}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}$

Q.16 If $x = \frac{\sqrt{3}-1}{\sqrt{3}+1}$ and $y = \frac{3+2\sqrt{2}}{3-2\sqrt{2}}$ then find the value of x + y.

Q.17 Find the value of $x^3 + y^3 - 12xy + 64$ when $x+y = -4$.

OR

If $x = 2y + 6$ then find the value of $x^3 - 8y^3 - 36xy - 216$.

Q.18 Factorize: $27 (x+y)^3 - 8 (x-y)^3$.

Q.19 Using suitable identity evaluate $(998)^3$.

Q.20 A traffic island is a parallelogram with perimeter 84m. One of the sides is 24m and a diagonal is 30 m. Find the cost of surfacing at the rate of Rs 200 per sq m.

Q.21 In figure -5, if BE is bisector of $\angle ABC$ and CE is bisector of $\angle ACD$, then show that $\angle BEC = \frac{1}{2}\angle BAC$.

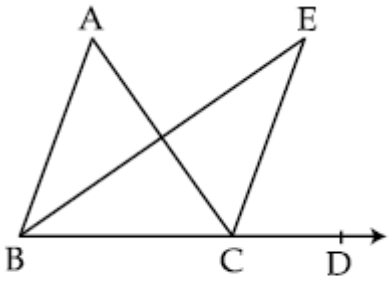

Figure - 5

Q.22 Show that in a right angled triangle, the hypotenuse is the longest side.

Q.23 In figure -6, if AB||CD, EF⊥CD and ∠GED = 126° then find ∠AGE, ∠GEF and ∠FGE.

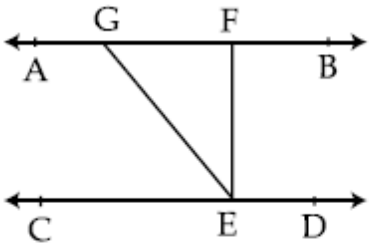

Figure - 6

Q.24 In an isosceles triangle ABC with AB = AC, BD and CE are two medians. Prove that BD = CE.

OR

In figure -7, if PS= PR, ∠TPS = ∠QPR then prove that PT = PQ.

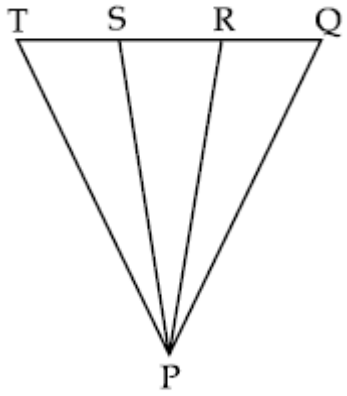

Figure - 7

SECTION – D

Q.25 Prove that:

$2x^3+2y^3+2z^3 -6xyz = (x+y+z)\,[(x-y)^2\,(y-z)^2+\,(z-x)^2]$ hence evaluate

$2\,(7)^3+2(9)^3+2(13)^3-6(7)\,(9)\,(13)$.

Q.26 Factorize: $2y^3 + y^2 - 2y - 1$.

OR

If $x+\frac{1}{x}=5$ then evaluate $x^6+\frac{1}{x^6}$.

Q.27 In figure -8, If PQ ⊥ PS, PQ||SR, ∠SQR = 28° and ∠QRT = 65° then find the values of x and y.

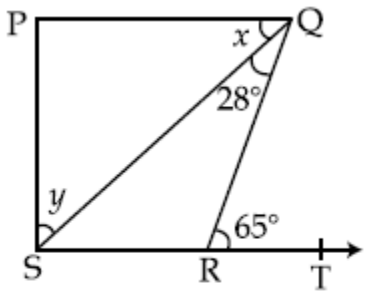

Figure - 8

Q.28 Prove that sum of the angles of a hexagon is 720°.

Q.29 In a triangle ΔPQR, PR > PQ and PS is the bisector of ∠QPR. Prove that ∠PSR > ∠PSQ.

Q.30 In figure – 9, two sides AB and BC and the median AM of ΔABC are respectively equal to sides DE and EF and the median DN of ∠DEF. Prove that ΔABC ≅ ∠DEF.

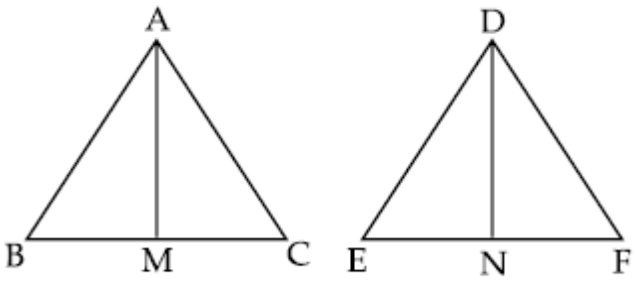

Figure - 9

OR

In figure – 10, PS is the bisector of ∠PQR and PT ⊥ QR. Show that

$\angle TPS = \frac{1}{2}\,(\angle Q - \angle R)$

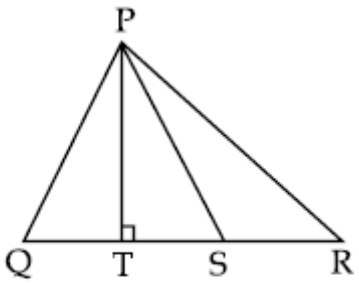

Figure - 10

Q.31 If $a+\sqrt{b}=\frac{\sqrt{13}-\sqrt{11}}{\sqrt{13}+\sqrt{11}}+\frac{\sqrt{13}+\sqrt{11}}{\sqrt{13}-\sqrt{11}}$, find the value of a and b.

Q.32 Express the following in the form $\frac{p}{q}$, where *p* and *q* are integers and $q \neq 0$.

(a) $0.\overline{001}$

(b) $2.\overline{3}$

Q.33 Factorise: x^4-13x^2+36.

Q.34 Draw the quadrilateral formed by the points P(3, 0), Q(-4, 0), R(0, 5) and S(0, -7).