**CBSE Sample Paper-02 (unsolved)**
**SUMMATIVE ASSESSMENT –I**
MATHEMATICS
**Class – IX**

Time allowed: 3 hours Maximum Marks: 90

**General Instructions:**

a) All questions are compulsory.
b) The question paper comprises of 31 questions divided into four sections A, B, C and D. You are to attempt all the four sections.
c) Questions 1 to 4 in section A are one mark questions. These are MCQs. Choose the correct option.
d) Questions 5 to 10 in section B are two marks questions.
e) Questions 11 to 20 in section C are three marks questions.
f) Questions 21 to 31 in section D are four marks questions.
g) There is no overall choice in the question paper. Use of calculators is not permitted.

**Section A**

Q1. If $x = y - \sqrt{y^2 - 1}$, then the value of $y$ in terms of $x$ is

a) $\frac{x^2 - 1}{2x}$

b) $\frac{x^2 - x + 1}{2x}$

c) $\frac{x^2 - x}{2x}$

d) $\frac{x^2 + 1}{2x}$

Q2. Zero of a zero polynomial is

a) 0

b) Not defined

c) Any real number

d) Any integer

Q3. The number of dimensions, a solid has:

a) 7

b) 5

c) 3

d) 1

Q4. If one of the angles of a triangle is $130°$, then the angle between the bisectors of the other two angles can be

a) $50°$

b) $65°$

c) $145°$

d) $155°$

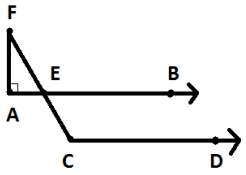
**SECTION- B**

Q5. Is zero a rational number ? Can you write it in the form of $\frac{p}{q}$, where $p$ and $q$ are integers and $q \neq 0$.

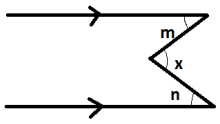
Q6. Find $p(0), p(1)$ for the polynomial $p(t) = 2 + t + 2t^2 - t^3$.

Q7. Prove or disprove: Euclidean geometry is valid only for curved surfaces.

Q8. In the following figure, $AB \| CD$ and $\angle F = 30°$, find $\angle FCD$.




Q9. In the following figure, prove that $m + n = x$.




Q10. If , $\Delta PQR \cong \Delta ABC$ , then is it true to say that $PR = AC$ ? Give reason for your answer.

**SECTION - C**

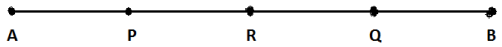
Q11. Examine , whether $\left(\sqrt{3}+2\right)^2$ is an irrational number or a rational number.

Q12. Represent $\sqrt{3}$ on a number line. Write steps of drawing number line also.

Q13. Without actual division, prove that $2x^4 - 6x^3 + 3x^2 + 3x - 2$ is exactly divisible by $x^2 - 3x + 2$.

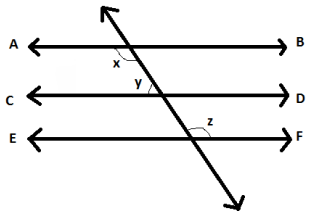
Q14. Find the value of '$a$', if $(x+1)$ is a factor of polynomial $ax^3 - 9x^2 + x + 6a$.

Q15. In the following figure, $R$ is the midpoint of the segment $AB$. $P$ and $Q$ are mid points of the segments $AR$ and $BR$ respectively. Prove that $AP = BQ = \frac{1}{4}AB$.




Q16. If two parallel lines are intersected by a transversal prove that the bisectors of the two pairs of interior angles enclose a rectangle.

Q17. In the following figure, if $AB \parallel CD, CD \parallel EF$ and $y : z = 3 : 7$, find $x$.




Q18. In a $\Delta PQR$, if $PQ = QR$ and $L, M$ and $N$ are the mid-points of the sides $PQ, QR$ and $RP$ respectively. Prove that $LN = MN$.

Q19. Points $A(5,3)$, $B(-2,3)$ and $D(5,-4)$ are three vertices of a square ABCD. Plot these points on a graph paper and hence find the coordinates of the vertex C.

Q20. Find the area of triangle, two sides are $18cm$ and $10cm$ and the perimeter is $42cm$.

**SECTION – D**

Q21. If $x = \frac{\sqrt{2p+3q} + \sqrt{2p-3q}}{\sqrt{2p+3q} - \sqrt{2p-3q}}$, then find the value of $3x^2q^2 - 4pqx + 3q^2$

Q22. A) Taking $\sqrt{3} = 1.732(approx.)$ and $\sqrt{5} = 2.236(approx.)$, evaluate $\frac{1}{4\sqrt{3} - 3\sqrt{5}}$ correct to three places of decimals.

B) Prove that: $\left[8^{\frac{-2}{3}} * 2^{\frac{1}{2}} * 25^{\frac{-5}{4}}\right] \div \left[32^{\frac{-2}{5}} * 125^{\frac{-5}{6}}\right] = \sqrt{2}$

Q23. If $a, b, c$ are all non-zero and $a + b + c = 0$, prove that $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3$

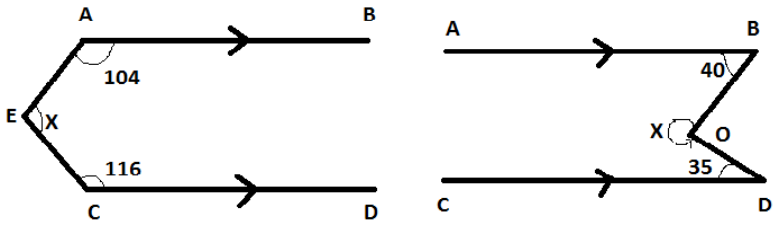
Q24. Prove that : $(a+b+c)^3 - a^3 - b^3 - c^3 = 3(a+b)(b+c)(c+a)$

Q25. What must be subtracted from $4x^4 - 2x^3 - 6x^2 + x - 5$ so that the result is exactly divisible by $2x^2 + x - 1$?

Q26. Factorise : $x^3 - 3x^2 - 9x - 5$

Q27. Prove that the bisectors of two adjacent supplementary angles include a right angle.

Q28. In the following figures, $AB \parallel CD$. Find the value of $x$.




Q29. In a triangle, prove that the greater angle has the longer side opposite to it.

Q30. If two isosceles triangles have a common base, prove that the line joining their vertices bisects them at right angles.

Q31. $\Delta ABC$ is an equilateral triangle where each side is of length $x$ units. Find the area of the $\Delta ABC$, using Heron's formula. Hence find the area of equilateral $\Delta ABC$ if its perimeter is $120m$.