CBSE Sample Paper 01 (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 and y are rational numbers such that $x^3 = y^3$, then

a) $x = y$

b) $x \neq y$

c) $x \geq y$

d) $x \leq y$

Q2. Which one of the following is a polynomial?

a) $3\sqrt[3]{x^3} + 5$

b) $\frac{1}{a} + 2a$

c) $\sqrt{x} + 2x^2 + 4$

d) $\sqrt[6]{x^3} + 4$

Q3. Having same base and same altitudes of two triangles are necessarily to be

a) Congruent

b) Equal area

c) Equal sides

d) Equal perimeter

Q4. The nature of x and y in third quadrant of Cartesian plane is

a) $x > 0, y < 0$

b) $x < 0, y < 0$

c) $x > 0, y > 0$

d) $x < 0, y > 0$

Q5. Insert a rational and an irrational number between 3 and 4.

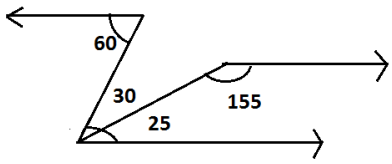
Q6. Show that 5 is a zero of the polynomial $2x^3 - 7x^2 - 16x + 5$

Q7. How many planes can be made to pass through three distinct points when

a) Three distinct points are collinear.

b) Three distinct points are non-collinear.

Q8. In the following figure, show that $AB \| EF$.



Q9. Prove that if two sides of an angle are perpendicular to two sides of another angle, then the angles are either equal or supplementary.

Q10. ABC is a triangle and Q is the midpoint of BC. The perpendiculars from Q to AB and AC are equal. Prove that the triangle is isosceles.

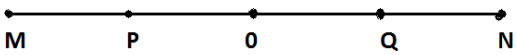
Q11. Prove that $\sqrt{2}$ is not a rational number.

Q12. Represent $\sqrt{7.3}$ on a number line. Write steps of drawing number line also.

Q13. If $ax^3 + bx^2 + x - 6$ has $x + 2$ is a factor and leaves a remainder 4 when divided by $x - 2$. Find the value of a and b.

Q14. Factorize $x^3(y-z)^3 + y^3(z-x)^3 + z^3(x-y)^3$

Q15. If O is the mid-point of the line segment MN. P and Q are mid-points of the line segments MO and ON respectively.

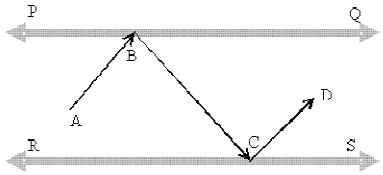


Prove that :

a) $MN = 4MP$

b) $MN = 4QN$

Q16. In the following figure, PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that $AB \parallel CD$.



Q17. It is given that $\angle XYZ = 64°$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects $\angle ZYP$, find $\angle XYQ$ and reflex $\angle QYP$.

Q18. Prove that the sum of three altitudes of a triangle is less than the sum of the three sides of the triangle.

Q19. Show that the points $(7,10)$, $(-2,5)$ and $(3,-4)$ are the vertices of an isosceles right triangle.

Q20. An umbrella is made by stitching 10 triangular piece of cloth of two different colors red and green. Each piece measuring 20cm, 50cm and 50cm. How much cloth of each colors required for the umbrella if both the colors are used equally?

Q21. If $x = \dfrac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}$ and $y = \dfrac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$, then prove that $3a^2 + 4ab - 3b^2 = 4 + \dfrac{56}{3}\sqrt{10}$.

Q22. A) Prove that: $\dfrac{2^{x-1}+2^x}{2^{x+1}-2^x} = \dfrac{3}{2}$

B) Find the value of x if $\dfrac{3^{3x} * 3^{2x}}{3^x} = \sqrt[4]{3^{20}}$

Q23. Find the integral zeroes of the polynomial $x^3 + x^2 + x - 3$.

Q24. Factorise: $x^3 - 2x^2 - x + 2$

Q25. What must be added to $x^4 + 2x^3 - 2x^2 + x - 1$ so that the result is exactly divisible by $x^2 + 2x - 3$?

Q26. If $\left(x - \dfrac{1}{2}\right)$ and $(x-2)$ are factors of $px^2 + 5x + r$, prove that $p = r$.

Q27. In the following figure, $AB \parallel CD$

1) If $\angle 4 = (x+20)°$ and $\angle 5 = (x+8)°$, find the measure of $\angle 4$ and $\angle 5$.

2) If $\angle 2 = (3x-10)°$ and $\angle 8 = (5x-30)°$, find the measure of $\angle 2$ and $\angle 8$.

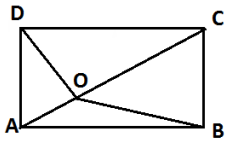
Q28. Prove that sum of all angles around a point is $360°$.

Q29. Prove that ΔABC is isosceles if any one of the following holds:

1) Altitude AD bisects BC.

2) Median AD is perpendicular to the base BC

Q30. A point O is taken inside a quadrilateral ABCD, such that $BO = OD$ and $AD = AB$. Show that AC is a straight line.



Q31. If ABCD is a quadrilateral with sides of length a, b, c and d such that ABCD is both cyclic and has a circle inscribed in it, then use brahmagupta's formula to show that area of the quadrilateral is $A = \sqrt{abcd}$.