

HALF YEARLY EXAMINATION, SEPTEMBER 2019
SAMPLE PAPER
MATHEMATICS

Class: IX

Max.Marks: 80

Date:

Time: 3 hrs

General Instructions:

- (i) All questions are compulsory.
(ii) The question paper consists of 30 questions divided into four sections A, B, C, and D. Section A comprises of 20 questions of 1 mark each, section B comprises of 6 questions of 2 marks each, section C comprises of 8 questions of 3 marks each, section D comprises of 6 questions of 4 marks each.
(iii) Use of calculator is not permitted.

SECTION - A

Multiple choice questions:(Question numbers 1 to 10)

1. The product of any two irrational numbers is 1
a) always an irrational number
b) always a rational number
c) always an integer
d) sometimes rational, sometimes irrational
2. Every rational number is 1
a) a natural number b) an integer c) a real number d) a whole number
3. Degree of the zero polynomial is 1
a) 0 b) 1 c) -1 d) not defined
4. The value of $2492 - 2482$ is 1
a) 12 b) 10 c) 497 d) 0
5. The linear equation $2x - 5y = 7$ has 1
a) infinitely many solutions b) two solutions c) a unique solution d) no solution
6. Any point on the y – axis is of the form 1
a) (x , 0) b) (0 , y) c) (0 , 0) d) (x , y)
7. Point (-2, 6) lies in the 1
a) I quadrant b) II quadrant c) III quadrant d) IV quadrant
8. Euclid divided his famous treatise “ The Elements” into 1
a) 13 chapters b) 12 chapters c) 11 chapters d) 9 chapters
9. If one angle of a triangle is equal to the sum of the other two angles, then the triangle is 1
a) isosceles b) right angled c) equilateral d) obtuse angled
10. Which of the following is not a criterion for congruence of triangles? 1
a) SSA b) ASA c) SAS d) SSS

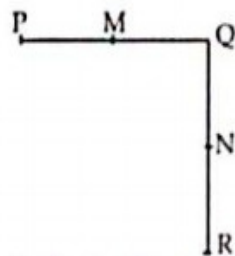
State true or false: (Question numbers 11 to 15)

11. The decimal expansion of $\sqrt{5}$ is non terminating recurring. 1
12. A zero of a polynomial is always zero. 1
13. The perpendicular distance of the point (5, 6) from x- axis is 5. 1

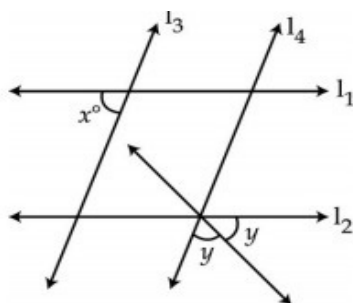
14. Lines parallel to the same line are parallel to each other. 1
15. In a triangle sum of two angles is greater than the third angle. 1
- Very short answer :(Question numbers 16 to 20)
16. Find the value of $(81)^{0.16} \times (81)^{0.09}$ 1
17. If $p(x) = x^2 - 2\sqrt{2}x + 1$, then find the value of $p(2\sqrt{2})$. 1
18. State one of Euclid's axiom. 1
19. Find the angle whose complement is equal to the angle itself. 1
20. In triangle PQR, $PQ = PR$ and $\angle Q = 65^\circ$. Find $\angle R$. 1

SECTION - B

21. If a, b, c are all non zero and $a + b + c = 0$, prove $\frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab} = 3$. 2
22. 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
23. If the point $(2k - 3, k+2)$ lies on the graph of the equation $2x + 3y + 14 = 0$, find the value of k. 2
24. In the given figure, $QM = QN$, M is the midpoint of PQ and N is the midpoint of QR. Show that $PQ = QR$. State which Euclid's axiom you use here. 2



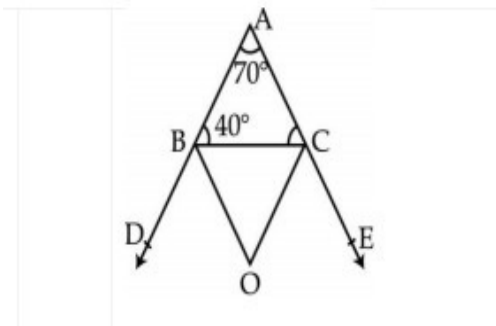
25. In the given figure , if l_1 is parallel to l_2 and l_3 is parallel to l_4 . What is the value of x? 2



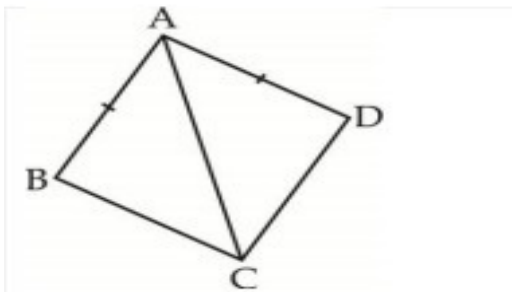
26. A, B, C are the three angles of a triangle. If $A - B = 150$, $B - C = 300$, find $\angle A$, $\angle B$ and $\angle C$. 2

SECTION – C

27. Find the values of a and b if $\frac{5 + \sqrt{6}}{\sqrt{6}} = a + b\sqrt{6}$. 3
28. Find the value of $\frac{330 + 329 + 328}{31 + 30 + 29}$. 3
29. Show that $(ax - y)x + y (ay - z) y + z (az - x) z + x = 1$. 3
30. If $x + \frac{1}{x} = 3$, then find $(x^3 + \frac{1}{x^3})$ 3
31. (i) Plot the points A(3,0), B(5,0), C(5,3) and D(3,3). 3
 (ii) Name the figure obtained by joining A, B, C and D
 (iii) Find the area of the figure.
32. In the figure, BO and CO are bisectors of $\angle DBC$ and $\angle ECB$ respectively. If $\angle BAC = 70^\circ$ and $\angle ABC = 40^\circ$, find the measure of $\angle BOC$. 3



33. In the figure, ABCD is a quadrilateral such that AB = AD and AC is the bisector of $\angle A$. Show that (i) $\angle ABC = \angle ADC$ (ii) BC = DC. 3



34. Prove that when two lines intersect each other then vertically opposite angles formed are equal. 3

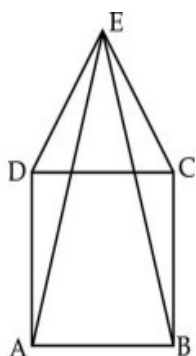
SECTION – D

35. Prove that $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$ 4

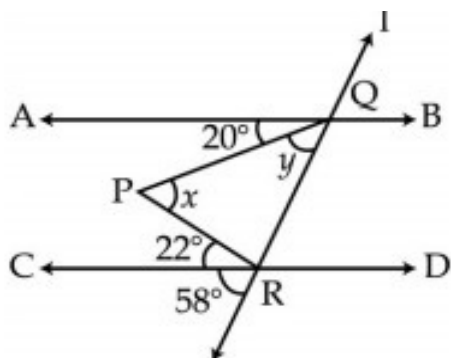
36. Find the value of p if the polynomial $p(x) = x^4 - 2x^3 + 3x^2 - px + 3p - 7$ when divided by $(x + 1)$ leaves the remainder 19. Also find the remainder when $p(x)$ is divided by $x+2$. 4

37. Draw the graphs of the following equations on the same graph sheet : 4
 $x-y = 0$, $x+y = 0$, $y+5=0$. Also find the area enclosed between these lines.

38. In the given figure ABCD is a square. $\triangle DEC$ is an equilateral triangle. Prove that 4
 (i) $\triangle BCE \cong \triangle ADE$ (ii) $BE = AE$



39. In the given figure, find the value of x and y if AB is parallel to CD. 4



40. In the given figure, the side QR of $\triangle PQR$ is produced to a point S. If the bisectors of $\angle PQR$ and $\angle PRS$ meet at point T, then prove that $\angle QTR = \frac{1}{2} \angle QPR$. 4

