

HALF YEARLY EXAMINATION, 2018-19

MATHEMATICS

Time : 3 hrs.

Class - IX

M.M. : 80

Date – 26.09.2018 (Wednesday)

Name of the student _____ Section _____

General Instructions

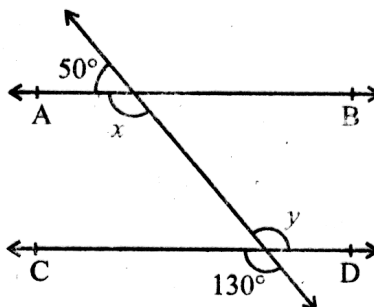
- All questions are compulsory.
- The question paper consists of 30 questions divided into 4 sections A, B, C and D. Section A comprises 6 questions of 1 mark each, Section B comprises 6 questions of 2 marks each, Section C comprises 10 questions of 3 marks each and Section D comprises 8 questions of 4 marks each.
- There is no overall choice. However internal choice has been provided in 4 questions of Section C and in 3 questions of Section D. You have to attempt only one of the alternatives in all such questions.
- Use of calculator is not permitted.

SECTION-A

- Q1. Write whether the following statement is true or false.
0 is a rational number.
- Q2. Write the degree of a non-zero constant polynomial .
- Q3. Write the coordinates of the origin.
- Q4. Write the general form of a linear equation in two variables.
- Q5. How many lines can be drawn passing through two given points ?
- Q6. What is the probability of an impossible event?

SECTION-B

- Q7. Express $0.\bar{3}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
- Q8. Verify whether -2 and 0 are zeroes of polynomial $x^2 - 2x$.
- Q9. In which quadrant or on which axes the points $(-2, 4)$, $(3, -1)$, $(-1, 0)$ & $(-3, -4)$ lie?
- Q10. Find two solutions of $4x + 3y = 12$.
- Q11. In the adjoining figure, find the value of x and y and then show that $AB \parallel CD$.



Q12. The percentage of marks obtained by a student in the monthly unit tests are given below:

Unit test	I	II	III	IV	V
Percentage of marks obtained	69	71	73	68	74

Find the probability that the student gets more than 70% marks in a unit test.

SECTION-C

Q13. If both a and b are rational numbers, find the values of a and b in

$$\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$$

Q14. Represent $\sqrt{3.5}$ on the number line.

Q15. Evaluate 249×251 using an identity.

Q16. Find k , if $(x - 2)$ is a factor of $2x^3 - 6x^2 + 5x + k$.

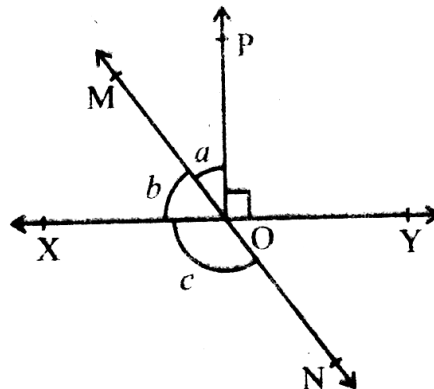
Q17. (a) Plot $(-3,0)$, $(5,0)$ and $(0,4)$ on cartesian plane. Name the figure formed by joining these points and find its area.

OR

(b) Plot the following points : $P(-1, 0)$, $Q(2, 0)$, $R(2, 3)$, $S(-1, 5)$.

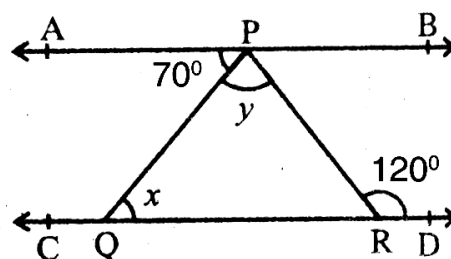
Write the name of the figure formed by joining the points and find its area.

Q18. (a) In the adjoining figure, lines XY and MN intersect at O . If $\angle POY = 90^\circ$ and $a : b = 2 : 3$, then find the value of c .



OR

(b) In the adjoining figure, if $AB \parallel CD$, $\angle APQ = 70^\circ$ and $\angle PRD = 120^\circ$, find x and y .



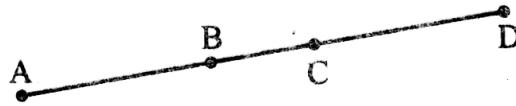
Q19. (a) Draw the graph of $y = 3x$

OR

(b) If the point (3,4) lies on the graph of the equation $3y = ax+7$, find the value of 'a'.

Q 20. Write any three Euclid's axioms.

Q 21. In the adjoining figure, if $AC = BD$ then prove that $AB = CD$.



Q22. (a) A tyre manufacturing company kept a record of the distance covered before a tyre needed to be replaced. The table shows the result of 1000 cases:

Distance (in km)	Less than 4000	4000 to 9000	9001 to 14000	More than 14000
Frequency	20	210	325	445

If you buy a tyre of this company, what is the probability that

- it will need to be replaced before it has covered 4000km?
- it will last for more than 9000km?
- it will need to be replaced after it has covered somewhere between 4000km and 14000km ?

OR

(b) Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardised conditions favourable for germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follows:-

Bag	I	II	III	IV	V
Number of seeds germinated	40	48	42	39	41

What is the probability of germination of

- more than 40 seeds in a bag?
- 49 seeds in a bag?
- more than 35 seeds in a bag?

SECTION-D

Q23. Prove that: $\left(\frac{x^a}{x^b}\right)^{\frac{1}{ab}} \left(\frac{x^b}{x^c}\right)^{\frac{1}{bc}} \left(\frac{x^c}{x^a}\right)^{\frac{1}{ca}} = 1$.

OR

If $x = \frac{\sqrt{7}}{5}$ and $\frac{5}{x} = p\sqrt{7}$, find p .

Q24. If $a = \frac{2+\sqrt{5}}{2-\sqrt{5}}$ and $b = \frac{2-\sqrt{5}}{2+\sqrt{5}}$, then find the value of $a^2 - b^2$

Q25. Factorise : $8p^3 + \frac{12}{5}p^2 + \frac{6}{25}p + \frac{1}{125}$

Q26. a) Factorise : $125a^3 + 64b^3$

OR

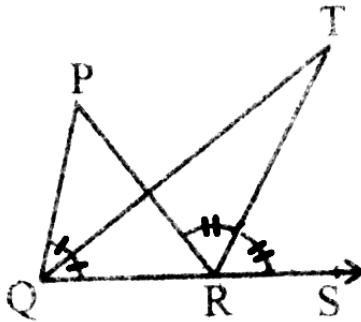
b) Factorise : $24x^2 - 45x + 21$

Q27. (a) If three-wheeler scooter charges Rs. 15 for first kilometre and Rs. 8 each for every subsequent kilometre. For a distance of x km, an amount of Rs y is paid. Write the linear equation representing the above information and draw its graph.

OR

(b) Pallavi and Neha decided to donate Rs 100 for the earthquake victims in Prime Minister's relief fund. Considering Pallavi's share as x and Neha's share as y , form a linear equation in two variables representing the above information and draw its graph.

Q28. In the adjoining figure, the side QR of ΔPQR is produced to point S. If the bisector of $\angle PQR$ and $\angle PRS$ meet at point T, then prove that $\angle QTR = \frac{1}{2} \angle QPR$.



Q29. If a transversal intersects two lines, such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel.

Q30. Prove that if a side of a triangle is produced, then the exterior angle so formed is equal to the sum of the two interior opposite angles.

