साधना देवी विद्यापीठ

Punjabi Colony (Dharampur) Samastipur. 848101 (Bihar)

Half Yearly Examination- 2018-19

Class :- IX
Sub :- Maths

Time :- 3 hrs
F.M. :-100

General instructions

1. Section A contains 8 questions of 1 mark each
2. Section B contains 6 questions of 2 marks each
3. Section C contains 10 questionsof 3 marks each
4. Section D contains 10 questions of 5 marks each

Section - A

1. Write a rational number lying between $\sqrt{2}$ and $\sqrt{3}$.
2. If $x + 1$ is factor of $2x^2 + kx$ then $k = ?$
3. Write the coefficient of x in $(x + 5)^2$.
4. In which quadrant point (0, -8) lies ?
5. Euclid's which axiom illustrate the statement that when $x + y = 15$ then $x + y + z = 15 + z$?
6. The angles of triangle are in the ratio 3:5:7 then write the name of triangle on the basis of angle.
7. In a trianlge ABC $3\angle A = 4\angle B = 6\angle C$ then A:B:C = ?
8. In $\triangle ABC$ and $\triangle DEF$ it is given that AB = DE , BC = EF then which condition must we need to make $\triangle ABC \cong \triangle DEF$ by SAS ?

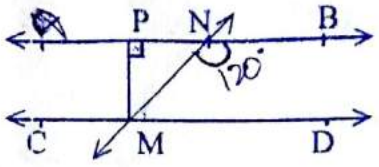
Section - B

9. Solve $(3-\sqrt{11})(3+\sqrt{11})$
10. Simplify $(32)^{\frac{1}{5}} + (-7)^0 + (64)^{\frac{1}{3}}$
11. $\left[\{(256)^{-\frac{1}{2}}\}^{-\frac{1}{4}}\right]^2$
12. Is the product of a rational and an irrational number always irrational ? Give an exmaple.
13. ABC and BDE are two equileteral triangles such that Dis the mid point of BC. Then find $\frac{ar\ (AMC)}{ar\ (BDE)}$
14. Angles of a triangle are in the ratio 2:3:4 find the largest anlge of the triangle.

Section - C

15. Locate $\sqrt{3}$ on the number line.
16. Prove that $\left(\frac{x^a}{x^b}\right)^{\frac{1}{ab}} \left(\frac{x^b}{x^c}\right)^{\frac{1}{bc}} \left(\frac{x^x}{x^a}\right)^{\frac{1}{ca}} = 1$
17. In which quadrant each of the points (-2, 4), and (7, 5) lie show on the cartesian plane.
18. Prove that every line segment has one and only one mid point.
19. If two lines intersect each other than prove that vertically opppsite angles are equal.

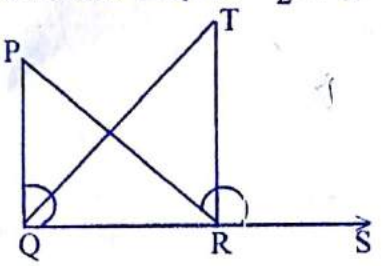
20. In the adjoining figure
AB||CD
$\angle MNB = 120^0$
Find $\angle PMN$ and $\angle NMD$.

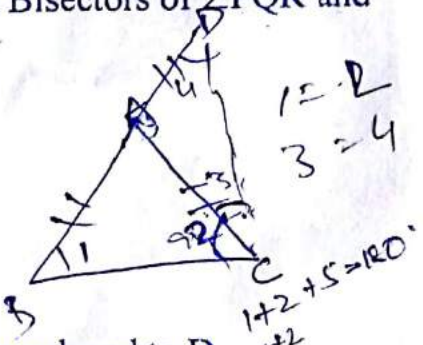


21. Show that in a right angle triangle hypotenuse is the largest side.
22. If $x = 3 + 2\sqrt{2}$, then find the value of $\sqrt{x} - \frac{1}{\sqrt{x}}$
23. If $a + b = 10$, $a^2 + b^2 = 58$ Find value of $a^3 + b^3$.
24. Two lines AB and CD intersect each other at O. If $\angle AOC + \angle COB + \angle BOD = 255^0$. Find angles $\angle AOC$, $\angle COB$, $\angle BOD$ and $\angle DOA$

Section - D

25. (i) Represent $\sqrt{9.3}$ on the number line.
(ii) Rationalise the denominator of $\frac{1}{\sqrt{7} - \sqrt{6}}$
26. Factorise $x^3 - 23x^2 + 142x - 120$ by using factor theorem.
27. Prove that $x^3+y^3+z^3 - 3xyz = \frac{1}{2}(x+y+z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$ By dissolving L.H.S.
28. In the given figure PQR is a triangle, QR is produced to S. Bisectors of $\angle PQR$ and $\angle PRS$ meet at point T. Then prove that $\angle QTR = \frac{1}{2}\angle QPR$





29. ABC is an isosceles triangle in which AB = AC side BA is produced to D such that AD = AB prove that $\angle BCD = 90^0$
30. In right angled triangle ABC at C, M is the mid point of hypotenuse AB. C is joined to M and produced to point D such that DM = CM point D is joined to B. show that $\triangle DBC = \triangle ACB$ and $CM = \frac{1}{2}AB$.
31. O is any point in the interior of ABC prove that $OA + OB + OC > \frac{1}{2}(AB + BC + CA)$.
32. Without actual division prove that $2x^4 - 6x^3 + 3x^2 + 3x - 2$ is exactly divisible by $x^2 - 3x + 2$
33. If the polynomials $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when divided by x-3 find value of a.
34. If $x^3 + ax^2 + bx + 6$ has x-2 as a factor and leaves remainder 3 when divided by x-3. Find values of a and b.