DON BOSCO SCHOOL, SAMASTIPUR
HALF YEARLY EXAMINATION- 2019-20

CLASS – NINE™
SUB – MATHS

Date –21.09.19 (Saturday)
S.T- SURESH PD. SINGH

F.M – 90/ P.M- 40
Time allowed: 02:00 Hours Maximum

Section 'A'   10 X 3 = 30

1. Find the value of k, (x – 1) is a factor of p(x) in each of the following.

   $p(x) = x^2 - 3x + 2k$

2. Write $(3a + 4b\ 5c)^2$ in expanded form.

3. The angle of a triangle are in the ratio 2 : 3 : 4. Find the angles.

4. In Fig. AOB is a straight line,

   Find the value of x and $\angle AOC$ and $\angle BOC$

   $3x + 20°$ $4x - 36°$

5. Prove that angle opposite to equal sides of an isosceles triangle are equal.

6. ABC is a right angled-triangle in which $\angle A = 90°$ and AB = AC, Find $\angle B$ and $\angle C$.

7. The sides of triangle are 40 m, 24 m and 32 m. Find the area of the triangle.

8. A conical pit of top diameter 3.5 m is 12 m deep. What is its capacity in kilolitres.

9. Find the volume of a sphere whose surface area is 616 cm².

10. A conical tent is 10 m high and the radius of its base is 24 m. Find the

    (i) Slant height of the tent.

   (ii) Cost of the canvas required to make the tent, if the cost of 1 m² canvas is ₹70.

Section 'B'   10 X 5 = 50

11. If x = 3+√8, find the value of $x^2 + \dfrac{1}{x^2}$ and $x^3 + \dfrac{1}{x^3}$

12. Prove that, $(a + b)^3 + (b + c)^3 + (c + a)^3 - 3(a + b)(b + c)(c + a) = 2(a^3 + b^3\ c^3 - 3abc)$

13. Factories them, $x^3 - 23x^2 + 142x - 120$

14. Prove that the sum of any two sides of a triangle is greater than the third side.

15. In a isosceles triangle ABC, with AC = AB, The bisector of $\angle B$ and $\angle C$ intersects each other at O, Join A to O to show that,

(i) OB = OC

(ii) AO bisects ∠A

16. In triangle ABC, OB and OC are bisectors of ∠B and ∠C intersects O. Show that $\angle BOC = 90 + \frac{1}{2}\angle A$

A

O

B

C
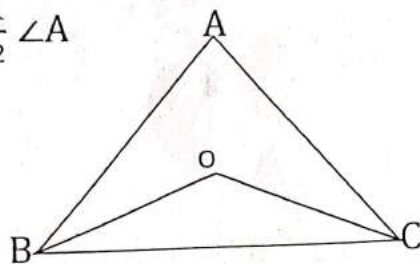
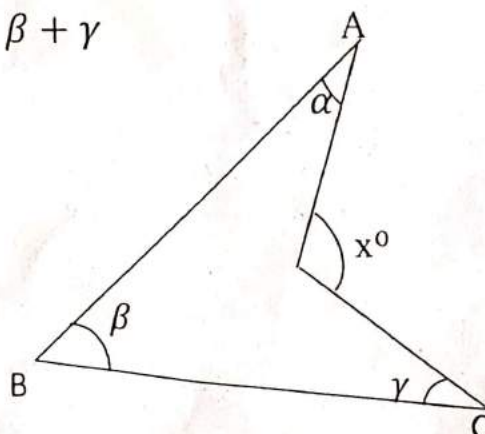17. In which quadrant or on which axis do each of the points lie (−2, 4), (0, −2), (3, 5), (−3, −2) and (2, 0)

18. The volume of a right cone is 9856 cm³. If the diameter of the base is 28 cm. Fine the,

(i) height of the cone

(ii) slant height of the cone

(iii) curved surface area of the cone

19. If the lateral surface area of a cylinder is 94.2 cm² and its height is 5 cm, then Find,   [Use π = 3.14]

(i) radius of the base.

(ii) its volume

20. In given fig. prove that $x = \alpha + \beta + \gamma$

A

α

x°

β

B

γ

C