

**ST. THOMAS SCHOOL**  
**WORKSHEET-4**  
**CLASS-IX (MATHEMATICS)**

1. Express the following in the form of  $\frac{p}{q}$ , where p and q are integers and  $q \neq 0$

i) 6.197777....    ii) 0.1343434...

2. Without actually calculating the cubes, find the value of

$$\left(\frac{-3}{4}\right)^3 + \left(\frac{-5}{8}\right)^3 + \left(\frac{11}{8}\right)^3$$

3. In a class number of girls is x that of boys is y. Also the number of girls is 10 more than the number of boys. Write the given data in the form of a linear equation in two variables. Also represent it graphically. Find graphically the number of girls, if the number of boys is 20.

4. Draw the graph of equations  $2x + 3y = -5$  and  $x + y = -1$  in the same graph. Find the co-ordinates of the point of intersection of two lines.

5. Write the co-ordinates of the vertices of a rectangle whose length and breadth are 8 and 5 units respectively. One vertex at (1, 0), the longer side lies on the x-axis and one of the vertices lies in the second quadrant.

6. A cloth having an area of  $165\text{m}^2$  is shaped into the form of a conical tent of radius 5cm.

i) How many students can sit in the tent if a student on an average occupies  $\frac{5}{7}\text{m}^2$  on the ground?

ii) Find the volume of the cone.

7. The surface area of a sphere of radius 5 cm is five times the curved surface area of a cone of radius 4 cm. Find the height and volume of the cone.

8. Ten observations 6, 14, 15, 17,  $x + 1$ ,  $2x - 13$ , 30, 32, 34, 43 are written in an ascending order. The median of the data is 24. Find the value of x.

9. The mean of five numbers is 15. If one number is excluded, their mean remains 15. Find the excluded number.

10. Mean of 25 observations was found to be 40.4. But later on, it was discovered that 53 was misread as 35 at one place. Find the correct mean.

11. Draw a histogram and frequency polygon on the same graph for the following distribution:

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
No of Students	7	10	6	8	12	3	2	2

12. If the mean of the following data is 20.2, find the value of p.

x	10	15	20	25	30
f	6	8	p	10	6

13. A teak wood log is cut first in the form of cuboid of length 2.3m, width 75cm and of certain thickness. Find its thickness, if its volume is  $1.104\text{m}^3$ . How many rectangular planks of size 2.3m x 75cm x 4cm can be cut from the cuboid?

14. Simplify:  $\sqrt[4]{81} - 8(\sqrt[3]{216}) + 15(\sqrt[5]{32}) + \sqrt{225}$ .
15. Prove that the sum of three angles of a triangle is  $180^\circ$ .
16. Solve using suitable identities.  
 i)  $1000^3 - 999^3$  ii)  $99^3$  iii)  $(2x - 3)^3$  iv)  $(2x - 3y + z)^2$
17. Find the value of a and b so that  $(x + 1)$  and  $(x - 1)$  are factors of  $x^4 + ax^3 + 2x^2 - 3x + b$ .
18. If  $x = \frac{\sqrt{2}+1}{\sqrt{2}-1}$  and  $y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$ , find the value of  $x^2 + y^2 + xy$ .
19. Plot the points A(0,3), B(5,3), C(4,0) and D(-1,0) on the graph paper. Identify the figure ABCD and find whether the point E(2,2) lies inside the figure or not?
20. AB and CD are two parallel lines intersected by transversal EF. Bisectors of interior angles BPQ and DQP intersect at R. Prove that  $\angle PRQ = 90^\circ$

