

1. if $x = 3$ is one root of the quadratic equation $x^2 - 2kx - 6$ then find the value of k
2. what is the HCF of smallest prime number and the smallest composite number
3. find the distance of a point $p(x, y)$ from the origin
4. In an AP , if the common difference $(d) = -4$, and the seventh term (a_7) is 4, then find the first term
5. what is the value of $(\cos^2 67^\circ - \sin^2 23^\circ)$
6. Given $\triangle ABC \sim \triangle PQR$, if $\frac{AB}{PQ} = \frac{1}{3}$ then find $\frac{ar\triangle ABC}{ar\triangle PQR}$
7. Given that $\sqrt{2}$ is irrational, prove that $(5 + \sqrt[3]{2})$ is an irrational number
8. In fig 1, $ABCD$ is a rectangle. Find the values of x and y

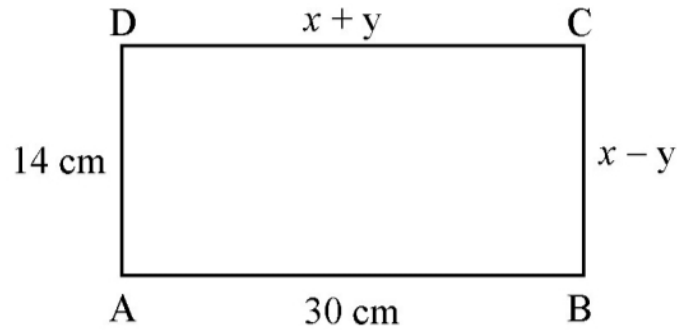


Figure 1: rectangular ABCD

9. Find the sum of first 8 multiples of 3
10. Find the ratio in which $p(4, m)$ divides the line segment joining the points $A(2, 3)$ and $B(6, -3)$. Hence find m
11. Two different dice are tossed together. find the probability;
 - i) of getting a doublet
 - ii) of getting a sum 10, of the numbers on the two dice
12. An integer is chosen at random between 1 and 100. find the probability that it is:
 - i) divisible by 8

- ii) not divisible by 8
13. Find HCF and LCM of 404 and 96 and verify that $HCF \times LCM =$ product of two given numbers
 14. Find the zeros of the polynomial $(2x^4 - 9x^3 + 3x - 1)$. if two of its zeros are $(2 + \sqrt{+3})$ and $(2 - \sqrt{+3})$
 15. If $A(-2, 1), B(a, 0), C(4, b)$ and $D(1, 2)$ are the vertices of a parallelogram ABCD, find the values of a and b. Hence find the length of its sides
(or)
If $A(-5, 7), B(-4, -5), C(-1, -6)$ and $D(4, 5)$ are the vertices of a quadrilateral, find the area of the quadrilateral ABCD
 16. A plane left 30 minutes late than its scheduled time and in order to reach the destination 1500 km away in time, it had to increase its speed by 100 km/h from the usual speed. find its usual speed.
 17. prove that the area of n equilateral triangle described on one side of the square is equal to half the area of the equilateral triangle described on one of its diagonal
(or)
If the area of two similar triangles are equal, prove that they are congruent
 18. prove that the lengths of tangents drawn from an external point to a circle are equal
 19. if $4 \tan \theta = 3$, evaluate $\left(\frac{4 \sin \theta - \cos \theta + 1}{4 \sin \theta + \cos \theta - 1}\right)$
(or)
If $(\tan 2A) = \cot(A - 18^\circ)$ where $2A$ is an acute angle, find the value of A .
 20. Find the area of the shaded region in fig 2, where arcs drawn with centers A, B, C and D intersect in pairs at mid-points P, Q, R and S of the sides AB, BC, CD and DA respectively of a square ABCD of side 12 cm. [use $\pi = 3.14$]

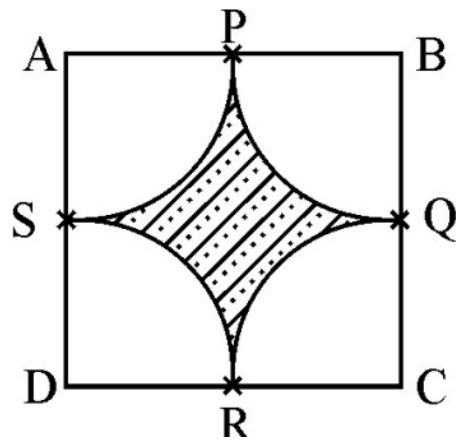


Figure 2: square ABCD

21. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in fig 3. If the height of the cylinder is 10 cm and its base is of radius 3.5 cm , find the total surface area of the article.

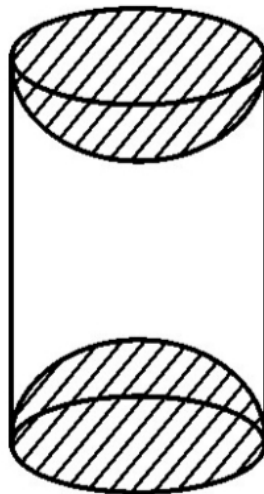


Figure 3: cylinder

22. The table below shows the salaries of 280 persons

(Salary in thousand ₹)	No of persons
5 – 10	49
10 – 15	133
15 – 20	63
20 – 25	15
25 – 30	6
30 – 35	7
35 – 40	4
40 – 45	2
45 – 50	1

Calculate the median salary of the data.

23. A motor boat whose speed is 18km/hr in still water takes 1hr more to go 24km upstream than to return down stream to the same spot. Find the speed of the stream.

(OR)

A train travels at a certain average speed for a distance of 63km and then travels at a distance of 72km at an average speed of 6km/hr more than its original speed. If it takes 3hours to complete total journey, what is the original average speed?

24. The sum of four consecutive numbers in an AP is the ratio of the product of the first and the last term to the product of two middle terms is $7 : 5$. Find the numbers.

25. In an equilateral $\triangle ABC$, D is a point on side BC such that $BD = \frac{1}{3}BC$. Prove that $9(AD)^2 = 7(AB)^2$.

(OR)

Prove that in a right triangle, the square on the hypotenuse is equal to the sum of the square on the other sides.

26. Draw a triangle ABC with $BC = 6\text{cm}$, $AB = 5\text{cm}$ and $\angle C = 60^\circ$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the $\triangle ABC$.

27. Prove that $\frac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A} = \tan A$

28. The diameters of the lower and upper ends of a bucket in the form of a frustum of a cone are 10cm and 30cm respectively. If its height is 24cm , find:

- The area of the meta sheet used to make the bucket.
- Why we should avoid the bucket made by ordinary plastic? [use $\pi = 3.14$]

29. As observed from the top of a 100m high light house from the sea-level, the angles of depression of two ships are 30° and 45° . If one ship is exactly behind the other on the same side of the light house, find the distance between the two ships. [use $\sqrt{3} = 1.732$]

30. The mean of the following distribution is 18. Find the frequency f of the class $19 - 21$.

class	11-13	13-15	15-17	17-19	19-21	21-23	23-25
frequency	3	6	9	13	f	5	4

(OR) The following distribution gives the daily income of 50 workers of a factory:

Daily Income (in ₹)	100-120	120-140	140-160	160-180	180-200	
Number of workers	12	14	8	6	10	

Convert the distribution above to a less than type cumulative frequency distribution and draw its ogive.