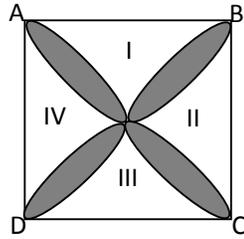


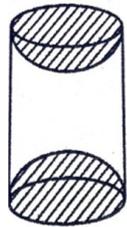
Guru Gobind Singh Public School
Sector V/B, B.S.City
CHAPTER WISE ASSIGNMENT
CLASS –X
SUBJECT – MATHEMATICS

- Given that $\sqrt{2}$ is irrational, prove that $(5+3\sqrt{2})$ is an irrational.
- Using Euclid's Division Lemma to show that the square of any positive integer is either of the form $3m$ or $3m+1$ for some integer m .
- Find the HCF of 180, 252 and 324 by using Euclid's Division Lemma.
- If $\frac{241}{4000} = \frac{241}{2^m 5^n}$, then find the values of m and n .
- If the polynomial $6x^4 + 8x^3 + 17x^2 + 21x + 7$ is divided by another polynomial $3x^2 + 4x + 1$, the remainder comes out to be $(ax+b)$, find a and b .
- Find all the zeroes of the polynomial $x^3 + 3x^2 - 2x - 6$, if two of its zeroes are $-\sqrt{2}$ and $\sqrt{2}$.
- Aditya is walking along the line joining points (1,4) and (0,6). Aditi is walking along the line joining points (3,4) and (1,0). Represent on graph and find the point where both of them cross each other.
- Solve for x : $\frac{x-1}{2x+1} + \frac{2x+1}{x-1} = 2$, where $x \neq -\frac{1}{2}, 1$
- Find the value of m for which the pair of linear equations:
 $2x + 3y + 7 = 0$; $(m-1)x + (m+1)y + (3m-1) = 0$ has infinitely many solutions.
- Find the value of p , for which one root of the quadratic equation $px^2 - 14x + 8 = 0$ is 6 times the other.
- If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + (b^2 - ac) = 0$ are equal, prove that either $a=0$ or $a^3 + b^3 + c^3 = 3abc$.
- For what value of k , the roots of the quadratic equation $(k+4)x^2 + (k+1)x + 1 = 0$ are equal?
- Two taps running together can fill a cistern in $3\frac{1}{13}$ minutes. If one pipe takes 3 minutes more than the other to fill it, find the time in which each pipe would fill the cistern.
- Find the sum of all multiples of 7 lying between 500 and 900.
- If the n^{th} term of an AP is $(2n+1)$. Find the value of S_{20} .
- The 4^{th} term of an A.P is zero. Prove that the 25^{th} term of the A.P is three times its 11^{th} term.
- Which term of the progression $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \dots$ is the first negative term?
- State and prove the Basic Proportionality Theorem.
- In a triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides. Using the above, do the following:
Prove that, in a ΔABC if AD is perpendicular to BC , then $AB^2 + CD^2 = AC^2 + BD^2$.
- Find the coordinate of the points of trisection of the line segment joining $(-2,-3)$ and $(4,-1)$.
- The ratio of the areas of two similar triangles is equal to the ratio of the squares of any two corresponding sides. Using the above result do the following:
Diagonals of a trapezium $ABCD$ with $AB \parallel DC$ intersect each other at the point O . If $AB=2CD$, find the ratio of the areas of triangles AOB and COD .
- In an equilateral triangle ABC , D is a point on side BC such that $BD = \frac{1}{3}BC$. Prove that $9AD^2 = 7AB^2$.
- 150 spherical marbles, each of diameter 1.4 cm are dropped in a cylindrical vessel of diameter 7 cm containing immersed in water. Find the rise in the level of water in the vessel.

24. A well of diameter 3 m is dug 14 m deep . The earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 4 m to form an embankment .find the height of the embankment .
25. Find the area of the shaded design in given figure, where ABCD is a square of side 10cm and semi-circles are drawn with each of the side as diameter.(Take $\pi = 3.14$)



26. .A metallic bucket ,open at the top, of height 24 cm is the form of the frustum of a cone ,the radii of whose lower and upper circular ends are 7 cm and 14 cm respectively . find :
- The volume of water which can completely fill the bucket .
 - The area of the metal sheet used to make the bucket.
27. The surface area of a solid metallic sphere is 616 cm square . It is melted and recast into a cone of height 28 cm . Find the diameter of the base of the cone so formed .
28. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder , as shown in figure . 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.



29. Find mean ,median and mode of the following data :

Classes	0-20	20-40	40-60	60-80	80-100	100-120	120-140
Frequency	6	8	10	12	6	5	3

30. The median of the distribution given below is 14.4 .Find the values of X and Y , if the total frequency is 20 .

Class Interval	0-6	6-12	12-18	18-24	24-30
Frequency	4	X	5	Y	1

31. During the medical check up of 35 students of a class ,their weight were recorded as follows

Weight in kg	Number of student
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than type ogive for the given data .Hence , obtain the median weight from the graph and verify the result by using the formula .

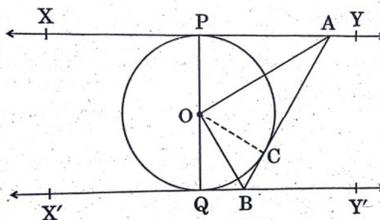
32. All the red face cards are removed from a pack of 52 playing cards .A cards is drawn at random from the remaining cards after reshuffling them . Find the probability that the drawn card is :
- (i) A king (ii) of red cards (iii) a queen (iv) an ace (v) a face card
33. Two different dice are thrown together , find the probability that the numbers obtained have (i) even sum. (ii) even product .

34. . Construct a triangle ABC with side BC = 7 cm , $\angle B = 45^{\circ}$, $\angle A = 105^{\circ}$,then construct another triangle whose sides are $\frac{3}{4}$ times the corresponding sides of the ΔABC .

35. Draw a circle of radius of 3 cm . Take two point P and Q on one of its diameters extended on both sides .each at a distance of 7 cm on opposite sides of its centre . Draw tangents to the circle from these two points P and Q .

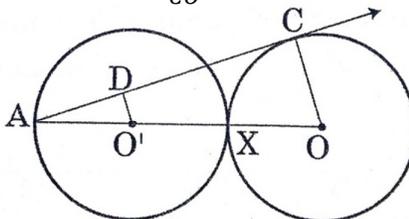
36. Prove that the lengths of tangents drawn from an external point to a circle are equal.

37. In figure , XY and X'Y' are two parallel tangents to a circle with centre O, touching the circle at point P and Q respectively. Another tangent AB intersect at C and intersecting XY at A and X'Y' at B . prove that , $\angle AOB = 90^{\circ}$.



38. If a quadrilateral ABCD is circumscribing a circle then $AB + CD = AD + BC$.

39. In figure , two equal circles , with centres O and O' touch each other at x, OO' produced meets the circle with centre O' at A. AC is tangent to the circle with centre O ,at the point C . O'D is perpendicular to AC .Find the values of $\frac{DO'}{CO}$.



40. If $\tan A = \frac{5}{12}$, find the value of $(\sin A + \cos A) \cdot \sec A$.

41. If the sum of first n terms of an AP is $2n^2 + 3n$, then What is its second term ?

42. Prove that following identity the angle involved is acute angle for which the expressions are defined :

$$\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$$

43. Prove the following identities :

(i) $(1 + \cot \theta - \operatorname{cosec} \theta) (1 + \tan \theta + \sec \theta) = 2$

(ii) $\frac{\sin A - \sin B}{\cos A + \cos B} + \frac{\cos A - \cos B}{\sin A + \sin B} = 0$

(iii) $\frac{1}{\sec x - \tan x} - \frac{1}{\cos x} = \frac{1}{\cos x} - \frac{1}{\sec x + \tan x}$

44. Evaluate without using trigonometric tables:

$$\frac{\operatorname{cosec}^2(90^{\circ} - \theta) - \tan^2 \theta}{4(\cos^2 48^{\circ} + \cos^2 42^{\circ})} - \frac{2 \tan^2 30^{\circ} \cdot \sec^2 52^{\circ} \cdot \sin^2 38^{\circ}}{\operatorname{cosec}^2 70^{\circ} - \tan^2 20^{\circ}}$$

45. An aeroplane is flying at a height of 300 m above the ground . Flying at this height , the angles of depression from the aeroplane of two points on both banks of a river in opposite directions are 45° and 60° respectively . Find the width of the river . ($\sqrt{3} = 1.73$) .
46. A man observes a car from the top of a tower which is moving towards the tower with a uniform speed . If the angle of the car changes 30° and 45° in 12 minutes , find the time taken by the car now to reach the tower .
47. At a point A, 20 metres above the level of water in a lake , the angle of elevation of a cloud is 30° . The angle of depression of the reflection of the cloud in the lake at A is 60° . Find the distance of the cloud from A .
48. In what ratio does the point $(\frac{24}{11}, y)$ divide the line segment joining the point P(2,-2) and Q(3,7). Also ,find the value of y .
49. If the point A(k+1,2k) , B (3k , 2k+3) and C(5k – 1,5k) are collinear ,then find the value of k .
50. Prove that , the points (3,0) , (6,4) and (-1 , 3) are vertices of a triangle of a right angled isosceles triangle .
51. ABCD is a rectangle , whose three vertices are B(4,0) , C (4,3) and D(0,3) .find the length of one of its diagonal .
