CLASS 10 NCERT MATHS MOST IMPORTANT EXAMPLES FOR BOARD EXAM 2023

CHAPTER - 1

Example 5: Consider the numbers 4^n, where n is a natural number. Check whether there is any value of n for which 4^n ends with the digit zero.

Example 7: Find the HCF of 96 and 404 by the prime factorisation method. Hence, find their LCM.

Example 9: Prove that $\sqrt{3}$ is irrational.

Example 10 : Show that $5 - \sqrt{3}$ is irrational.

CHAPTER - 2

Example 2: Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients.

CHAPTER - 3

Example 11: The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save ₹2000 per month, find their monthly incomes.

Example 13: The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?

CHAPTER - 4

Example 15: A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

CHAPTER -5

Example 6: Check whether 301 is a term of the list of numbers 5, 11, 17, 23, . . .

Example 9: A sum of ₹1000 is invested at 8% simple interest per year. Calculate the interest at the end of each year. Do these interests form an AP? If so, find the interest at the end of 30 years making use of this fact.

Example 16: A manufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year, find : (i) the production in the 1st year (ii) the production in the 10th year
(iii) the total production in first 7 years

CHAPTER -6

Theorem 6.1: If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same Ratio.

Example 3: In Fig. 6.16,PS/SQ = PT/TR and ∠ PST = ∠ PRQ. Prove that PQR is an isosceles triangle.

Example 7: A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

Example 8: In Fig. 6.33, CM and RN are respectively the medians of Δ ABC and Δ PQR. If Δ ABC ~ Δ PQR, prove that :
(i) Δ AMC ~ Δ PNR
(ii)CM/ AB = RN /PQ
(iii) Δ CMB ~ Δ RNQ

CHAPTER -7

Example 4: Find a relation between x and y such that the point (x, y) is equidistant from the points (7, 1) and (3, 5).

Example 5: Find a point on the y-axis which is equidistant from the points A(6, 5) and B(– 4, 3).

Example 7: In what ratio does the point (– 4, 6) divide the line segment joining the points A(– 6, 10) and B(3, – 8)?

Example 10: If the points A(6, 1), B(8, 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram, taken in order, find the value of p.

CHAPTER - 8

Example 5: In Δ OPQ, right-angled at P, OP = 7 cm and OQ – PQ = 1 cm (see Fig. 8.12). Determine the values of sin Q and cos Q.

Example 13: Prove that sec A (1 – sin A)(sec A + tan A) = 1.

Example 15: Prove that $\sin\theta - \cos\theta + 1 / \sin\theta + \cos\theta - 1 = 1 / \sec\theta - \tan\theta$, using the identity $\sec^2\theta = 1 + \tan^2\theta$.

CHAPTER -9

Example 2: An electrician has to repair an electric fault on a pole of height 5 m. She needs to reach a point 1.3 m below the top of the pole to undertake the repair work (see Fig. 9.5). What should be the length of the ladder that she should use which, when inclined at an angle of 60° to the horizontal, would enable her to reach the required position? Also, how far from the foot of the pole should she place the foot of the ladder? (You may take $\sqrt{3} = 1.73$)

Example 4: From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30°. A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45°. Find the length of the flagstaff and the distance of the building from the point P. (You may take $\sqrt{3} = 1.732$)

Example 5: The shadow of a tower standing on a level ground is found to be 40 m longer when the Sun's altitude is 30° than when it is 60°. Find the height of the tower.

Example 6: The angles of depression of the top and the bottom of an 8 m tall building from the top of a multi-storeyed building are 30° and 45°, respectively. Find the height of the multi-storeyed building and the distance between the two buildings.

CHAPTER - 10

Theorem 10.1: The tangent at any point of a circle is perpendicular to the radius through the point of contact.

Theorem 10.2: The lengths of tangents drawn from an external point to a circle are equal.

Example 2: Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that ∠ PTQ = 2∠OPQ.

Example 3: PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T (see Fig. 10.10). Find the length TP.

CHAPTER - 12

Example 3: Find the area of the segment AYB shown in Fig. 12.9 if radius of the circle is 21 cm and ∠ AOB = 120°. (Use π = 22/7)

CHAPTER - 13

Example 2: The decorative block shown in Fig. 13.7 is made of two solids a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block. (Take π = 22/7)

Example 3: A wooden toy rocket is in the shape of a cone mounted on a cylinder, as shown in Fig. 13.8. The height of the entire rocket is 26 cm,

while the height of the conical part is 6 cm. The base of the conical portion has a diameter of 5 cm, while the base diameter of the cylindrical portion is 3 cm. If the conical portion is to be painted orange and the cylindrical portion yellow, find the area of the rocket painted with each of these colours. (Take π = 3.14)

Example 4: Mayank made a bird-bath for his garden in the shape of a cylinder with a hemispherical depression at one end (see Fig. 13.9). The height of the cylinder is 1.45 m, and its radius is 30 cm. Find the total surface area of the bird-bath. (Take π = 22/7)

Example 5: Shanta runs an industry in a shed which is in the shape of a cuboid surmounted by a half cylinder (see Fig. 13.12). If the base of the shed is of dimension 7 m × 15 m, and the height of the cuboidal portion is 8 m, find the volume of air that the shed can hold. Further, suppose the machinery in the shed occupies a total space of 300 m^3, and there are 20 workers, each of whom occupy about 0.08 m^3 space on an average. Then, how much air is in the shed? (Take π = 22/7)

Example 6: A juice seller was serving his customers using glasses as shown in Fig. 13.13.The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm, find the apparent capacity of the glass and its actual capacity. (Use π = 3.14.)

CHAPTER - 14

Example 8: The median of the following data is 525. Find the values of x and y, if the total frequency is 100.

CHAPTER - 15

Example 9: Harpreet tosses two different coins simultaneously (say, one is of ₹1 and other of ₹2). What is the probability that she gets at least one head?

Example 13: Two dice, one blue and one grey are thrown at the same time. Write down all the possible outcomes. What is the probability that the sum of the two numbers appearing on the top of the dice is
(i) 8? (ii) 13? (iii) less than or equal to 12?