CLASS : X (CBSE)   **WORKSHEET-1**   **SUBJECT : MATHEMATICS**
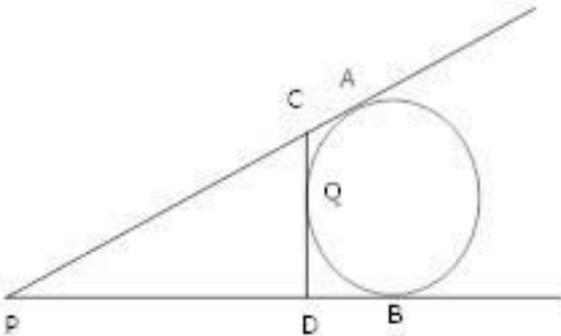**NAME OF THE STUDENT:**   **SEC:**   **ROLL NO.**   **DATE:**

Circles

1. The perimeter of a sector of a circle of radius 8 cm is 25m, what is area of sector?

(a) $50cm^2$ (b) $42cm^2$ (c) $52cm^2$ (d) none of these

1. In figure given below PA and PB are tangents to the circle drawn from an external point P. CD is a third tangent touching the circle at Q. If PA = 10 cm and DQ = 2 cm. What is length of PC?

(a) 8 cm (b) 7 cm (c) 4 cm (d) none of these

2. Tangent of circle intersect the circle

(a) Only one point (b) Two points (c) Three points (d) None of these

3. From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. The radius of the circle is

(a) 7 cm (b) 12 cm (c) 15 cm (d) 24.5 cm

4. In two concentric circles prove that all chords of the outer circle which touch the inner circle are of equal length.

5. PA and PB are tangents from P to the circle with centre O. At the point M, a tangent is drawn cutting PA at K and PB at N. Prove that KN=AK + BN.

6. In the given figure, O is the centre of the circle with radius 5 cm and AB||CD. If AB = 6 cm, find OP.
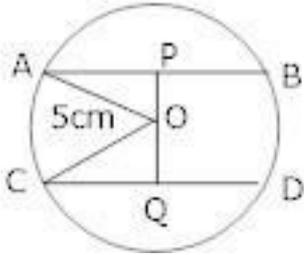
7. Prove that the tangents at the end of a chord of a circle make equal angles with the chord.

8. Two tangents TP and TQ are drawn from an external point T with centre O as shown in figure. If they are inclined to each other at an angle of 100°, then what is the value of $\angle POQ$?

9. Two concentric circles are of radii 5 cm and 3 cm, find the length of the chord of the larger circle which touches the smaller circle.

10. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC.

11. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at point T. Find the length TP.

12. In the given figure XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that $\angle AOB = 90^\circ$.
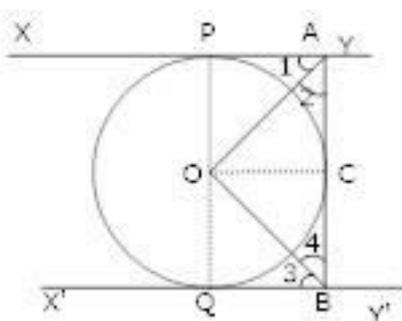
CLASS : X (CBSE)	WORKSHEET-2	SUBJECT : MATHEMATICS
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Construction

1. Construct a $\triangle ABC$ in which $AB = 6.5\ cm, \angle B = 60°$ and $BC = 5.5\ cm$. Also construct a triangle ABC similar to $\triangle ABC$ whose each side is $\dfrac{3}{2}$ times the corresponding side of the $\triangle ABC$.

2. Draw a circle of radius 4 cm from a point P, 7cm from the centre of the circle, draw a pair of tangents to the circle measure the length of each tangent segment.

3. Draw a right triangle in which the sides containing the right angle are 5 cm and 4 cm. Construct a similar triangle whose sides are $\dfrac{5}{3}$ times the sides of the above triangle.

4. Construct a $\triangle ABC$ in which CA = 6 cm, AB = 5 cm and $\angle BAC = 22\dfrac{1}{2}°$, then construct a triangle similar to the given triangle whose sides are $\dfrac{6}{5}$ of the corresponding sides of the $\triangle ABC$.

5. Construct a circle whose radius is equal to 4 cm. Let P be a point whose distance from its centre is 6 cm. Construct two tangents to it from P.

6. Draw a triangle ABC with sides BC = 6.3 cm, AB = 5.2 cm and $\angle ABC = 60°$. Then construct a triangle whose sides are $\dfrac{4}{3}$ times the corresponding sides of $\triangle ABC$.

Area related to circle

1. The circumference of a circular field is 528 cm. Then its radius is

(a) 42 cm (b) 84 cm

(c) 72 cm (d) 56 cm

2. The circumference of a circle exceeds its diameter by 180 cm. Then its radius is

(a) 3 cm (b) 12 cm

(c) 4 cm (d) 6 cm

3. Area of the sector of angle $^\circ$ of a circle with radius 10cm is

(a) $52\dfrac{5}{21}\,cm^2$ (b) $52\dfrac{8}{21}\,cm^2$

(c) $52\dfrac{4}{21}\,cm^2$ (d)none of these

4. Area of a sector of angle P of a circle with radius R is

(a) $\dfrac{P}{180}\times 2\pi R$ (b) $\dfrac{P}{180}\times \pi R^2$

(c) $\dfrac{P}{360}\times 2\pi R$ (d) $\dfrac{P}{720}\times 2\pi R^2$

5. Find the circumference of a circle of diameter 14 cm.

6. The diameter of a circular pond is 17.5 m. It is surrounded by a path of width 3.5 m. Find the area of the path.

7. Find the area of a sector of a circle with radius 6 cm, if angle of the sector $60°$.

8. Find the area of a quadrant of a circle whose circumference is 22 cm.

9. The cost of fencing a circular field at the rate of Rs. 24 per metre is Rs. 5280. The field is to be ploughed at the rate of Rs. 0.50 Per m². Find the cost of ploughing the field. $\left[\pi=\dfrac{22}{7}\right]$

10. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.

11. An umbrella has 8 ribs which are equally spaced as given in the figure. Assuming umbrella to be a flat circle of radius 45 cm. Find the area between two consecutive ribs of the umbrella.

12. Find the area of the shaded region if PQ = 24 cm, PR = 7 cm and O is the centre of the circle.
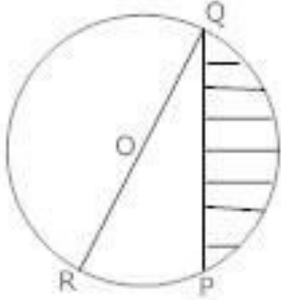
13. The area of an equilateral $\triangle ABC$ is 1732.5 cm^2 with each centre of the triangle as vertex of circle is drawn with radius equal to half the length of the side of triangle, find the area of the shaded region. $\left[\pi = 3.14 \quad \sqrt{3} = 1.73205 \right]$

CLASS : X (CBSE)   WORKSHEET-4   SUBJECT : MATHEMATICS
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Surface area and Volume

1. The number of solid spheres each of diameter 6 cm that could be molded to form a solid melted cylinder of height 45 cm and diameter 4 cm is

(a) 3

(b) 4

(c) 5

(d) 6

2. A metallic sphere of radius 10.5 cm is melted and then recast into small cones each of radius 3.5 cm and height 3 cm, the number of such cone is

(a) 63

(b) 126

(c) 21

(d) 130

3. A circular test is cylindrical to a height of 4m and conical above it. If its diameter is 105 m and its slant height is 40 m, then the total area of canvas required is

(a) 1760 m^2

(b) 2640 m^2

(c) 3960 m^2

(d) 7920 m^2

4. If the radii of the ends of a bucket are 5 cm and 15 cm and it is 24 cm high, then its Curved surface area is

(a) 1815.3 cm^2

(b) 1711.3 cm^2

(c) 2025.3 cm^2

(d) 2360 cm^2

5. A 20 m deep well with diameter 7 m is dug up and the earth from digging is evenly spread out to form a platform 22 ✕ 14 m. Find the height of the platform.

6. Find the maximum volume of a cone that can be carved out of solid hemisphere of radius r.

7. Find the volume of the largest right circular cone that can be cut out of the cube whose edge is 7 cm.

8. A hollow cylindrical pipe is 420 cm long. It's outer and inner diameter are 8 cm and 6 cm respectively. Find the volume of the copper used in making the pipe.

9. A plate of metal 1 cm thick, 9 cm broad and 81 cm long is melted into a cube. Find the difference in the surface area of the two solids.

10. The difference between outside and inside surfaces of a cylindrical metallic pipe 14 cm long is 44 cm². If the pipe is made of 99 cu. cm of metal. Find the outer and inner radii of the pipe.

11. If h, c and v respectively are the height, curved surface and volume of cone. Prove that
$$3\pi Vh^3 - c^2h^2 + 9v^2 = 0.$$

12. A toy is in the form of a cone mounted on a hemisphere of common base with radius 7 cm. The total height of the toy is 31 cm. Find the total surface area of the toy. $\left[\text{use } \pi = \dfrac{22}{7} \right]$

13. The radius of a solid iron sphere is 8 cm. Eight rings of iron plate of external radius $6\dfrac{2}{3} cm$ and thickness 3 cm are made by melting this sphere. Find internal radius of these rings.

Statistics

1. $\sum f_i = 15$, $\sum f_i x_i = 3p + 36$ and mean of any distribution is 3, then p = (a)

2 (b) 3 (c) 4 (d) 5

2. For what value of x, the mode of the following data is 8:

4	5	6	8	5	4	8	5	6	x	8

(a) 5 (b) 6 (c) 8 (d) 4

3. The numbers are arranged in ascending order. If their median is 25, then x =

5	7	10	12	2x-8	2x+10	35	41	42	50

(a) 10 (b) 11 (c) 12 (d) 9

4. The median for the following frequency distribution is

X	6	7	5	2	10	9	3
F	9	12	8	13	11	14	7

(a) 6 (b) 5 (c) 4 (d) 7

5. The following data gives the number of boys of a particular age in a class of 40 students. Calculate the mean age of students:

Age (in years)	15	16	17	18	19	20
No. of student	3	8	10	10	5	4

6. For the following grouped frequency distribution, find the mode.

Class	3-6	6-9	9-12	12-15	15-18	18-21	21-24
Frequency	2	5	10	23	21	12	3

7. Construct the cumulative frequency distribution of the following distribution:

Class	12.5-17.5	17.5-22.5	22.5-27.5	27.5-32.5	32.5-37.5
Frequency	2	22	19	14	13

8. The median and mode of a distribution are 21.2 and 21.4 respectively, find its mean.

9. The following table shows the weekly wages drawn by number of workers in a factory, find the median of the following data.

Weekly wages (in Rs.)	0-100	100-200	200-300	300-400	400-500
No. of workers	40	39	34	30	45

10. Find the median of the following data:

Marks	Frequency
Less than 10	0
Less than 30	10
Less than 50	25
Less than 70	43
Less than 90	65
Less than 110	87
Less than 130	96
Less than 150	100

11. Find the median of the following data.

Wages (in rupees)	No. of workers
More than 150	Nil
More than 140	12
More than 130	27
More than 120	60
More than 110	105
More than 100	124
More than 90	141
More than 80	150

12. Draw a less than Ogive for the following frequency distribution.

Marks	No. of students
0-4	4
4-8	6
8-12	10
12-16	8
16-20	4

13. In the following distribution, locate the median mean and mode.

Monthly consumption of electricity	65-85	85-105	105-125	125-145	145-165	165-185	185-205
No. of consumers	4	5	13	20	14	7	4

Probability

1. Cards each marked with one of the numbers 4, 5, 6, ... 20 are placed in a box and mixed thoroughly. One card is drawn at random from the box, what is the probability of getting an even prime number?

(a) 0 (b) 1 (c) 2 (d) 3

2. A bag contains 5 red and 4 black balls. A ball is drawn at random from the bag. What is the probability of getting a black ball?

(a) $\frac{1}{3}$ (b) $\frac{2}{9}$ (c) $\frac{4}{9}$ (d) None of these

3. A dice is thrown once, what is the probability of getting a prime number?

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{3}{2}$ (d) 0

4. What is the probability that a number selected from the numbers 1, 2, 3,... 15 is a multiple of 4?

(a) $\frac{1}{5}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) 1

5. Why is tossing a coin considered is the way of deciding which team should get the ball at the beginning of a football match?

6. An unbiased die is thrown, what is the probability of getting an even number?

7. Two unbiased coins are tossed simultaneously, find the probability of getting two heads.

8. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting a jack of hearts.

9. 18 cards numbered 1, 2, 3, ... 18 are put in a box and mixed thoroughly. A card is drawn at random from the box. Find the probabilities that the card bears

(i) an even number (ii) a number divisible by 2 or 3

10. A bag contains 5 red balls, 4 green balls and 7 white balls. A ball is drawn at random from the box. Find the probability that the ball drown is

(a) white (b) neither red nor white

11. A box contains 20 balls bearing numbers 1, 2, 3, 4,… 20. A ball is drawn at random from the box, what is the probability that the number on the ball is
(i) an odd number (ii) divisible by 2 or 3 (iii) prime number

12. A bag contains 5 red and some blue balls,
(i) if probability of drawing a blue ball from the bag is twice that of a red ball, find the number of blue balls in the bag.
(ii) if probability of drawing a blue ball from the bag is four times that of a red ball, find the number of blue balls in the bag.

13. A card is drawn at random from a well shuffled deck of playing cards. Find the probability that the card drawn is
(i) a card of spades or an ace (ii) a red king (iii) neither a king nor a queen

   (iv) either a king or a queen (v) a face card (vi) cards which is neither king nor a red card.