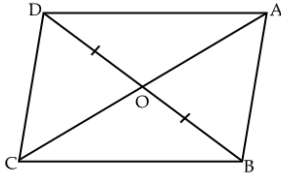23. In the figure, diagonals AC and BD of quadrilateral ABCD intersect at O such that OB = OD.  If AB = CD then show that

ar ($\Delta$DOC) = ar ($\Delta$AOB)



24. Three coins are tossed simultaneously 200 times with the following frequencies of different outcomes.

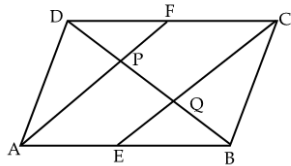| Outcome | 3 heads | 2 heads | 1 head | No head |
|---------|---------|---------|--------|---------|
| Frequency | 23 | 72 | 77 | 28 |

From the above compute the probability of the following :

(i)   at least 2 heads

(ii)   3 tails

(iii)   at most one head

**Section D (4 marks each)**

25.   In a parallelogram ABCD, E and F are the mid points of sides AB and CD respectively. Show that the line segment AF and EC trisects the diagonal BD.



26.   Construct a $\Delta$ABC whose perimeter is 12 cm, $\angle$B = 60° and $\angle$C = 45°.  Justify the construction.

**Or**

Construct a $\Delta$ABC in which $\angle$B = 30° and $\angle$C = 90° and the perimeter of the triangle is 11 cm.

27.   The taxi fare in a city is as follows : For the first kilometer, the fare is Rs. 8 and for the subsequent distance it is Rs. 5 per km.  Taking the distance covered as $x$ km and total fare as Rs. $y$, write a linear equation for this information, and draw its graph.

28.   A cone of radius 7 cm has a curved surface area 550 cm$^2$.  Find its volume. [use $\pi = \dfrac{22}{7}$ ]

29.   Two equal chords AB and CD of a circle when produced, intersect at point P.  Prove that PB = PD.

30.   Prove that the parallelograms on the same base and between the same parallels are equal in area.

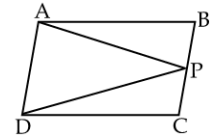9$^{th}$ CBSE Maths

**Test – 1**

Time: 3 h

**9$^{th}$ CBSE Maths**

Max Marks: 90

**Section A (MCQs – 1 mark each)**

1.   Age of '$x$' exceeds age of '$y$' by 7yrs.  This statement can be expressed as linear equation as :

(A)   $x + y + 7 = 0$     (B)   $x - y + 7 = 0$

(C)   $x - y - 7 = 0$     (D)   $x + y - 7 = 0$

2.   If area of $\|^{gm}$ ABCD is 80 cm$^2$ then ar ($\Delta$ADP) is :



(a)   80 cm$^2$     (b)   60 cm$^2$     (c)   50 cm$^2$     (d)   40 cm$^2$

3.   A linear equation in two variables has how many solutions ?

(A)   one     (B)   two     (C)   infinite     (D)   not possible

4.   In the given figure O is the centre of circle.  If $\angle$OAB = 30° and $\angle$OCB = 40°, then measure of $\angle$AOC is :
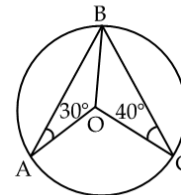


(a)   70°     (b)   220°     (c)   140°     (d)   110°

5.   Class mark of a particular class is 10.5 and class size is 7, then class interval is :

(A)   $10.5 - 17.5$     (B)   $3.5 - 10.5$     (C)   $7 - 17.5$     (D)   $7 - 14$

6.   Curved surface area of hemisphere of diameter 2r is :

(a)   $2\pi r^2$     (b)   $3\pi r^2$     (c)   $4\pi r^2$     (d)   $8\pi r^2$

7.   In a class, there are x girls and y boys, a student is selected at random, then the probability of selecting a boy is :

(A)   $x/y$     (B)   $x/(x+y)$     (C)   $y/(x+y)$     (D)   $y/x$

8.   If slant height of a cone is 13 cm and the base radius is 5 cm, then the height of cone is :

(A)   12 cm     (B)   8 cm     (C)   10 cm     (D)   18 cm

## Section B (2 marks each)

**9.** D is the mid point of side BC of ΔABC and E is the mid point of AD, then show that

ar (BED) $= \dfrac{1}{4}$ ar (ABC)

**10.** Curved surface area of a right circular cylinder is 4.4 m². If the radius of the base of the

cylinder is 0.7m, find its height. [use $\pi = \dfrac{22}{7}$].

**11.** Find the median of first ten prime numbers.

**12.** A die is thrown 500 times, the frequency of outcomes 1, 2, 3, 4, 5 and 6 are noted in the following frequency distribution table :

| Outcome | 1 | 2 | 3 | 4 | 5 | 6 |
|---------|----|----|----|----|----|----|
| Frequency | 90 | 70 | 75 | 95 | 88 | 82 |

Find the probability of occurrence of a prime number.

**13.** In the figure $\angle ABC = 69°$ ; $\angle ACB = 31°$. Find $\angle BDC$.
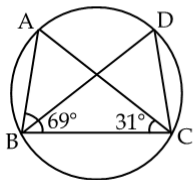


**Or**

In a cyclic quadrilateral ABCD, if AB ∥ CD and $\angle B = 70°$, find the measures of the remaining angles of the quadrilateral.

**14.** Find the mean of 3, 4, 6, 7, 8, 14. If 5 is added to each observation, what will be the new mean.

## Section C (3 marks each)

**15.** Draw the graph of the equation $2x - 3y = 5$. From the graph, find the value of y when $x = 4$.

**16.** In a quadrilateral ABCD, AO and BO are the bisectors of $\angle$ A and $\angle$ B respectively.

Prove that $\angle$ AOB $= \dfrac{1}{2}$ ($\angle$C + $\angle$D).

**17.** Construct a triangle ABC in which BC = 7.5 cm, $\angle B = 45°$ and AB − AC = 2.5 cm.

**18.** A right triangle ABC with sides 5 cm, 12 cm and 13 cm is revolved about the side 12 cm. Find the volume of the solid so obtained.

**Or**

What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6 m ? Assume that the extra length of material that will be required for

stitching margins and wastage in cutting is approximately 20 cm. [use $\pi = \dfrac{22}{7}$]

**19.** The following table gives the life time of 400 neon lamps :

| Life time (in hrs) | Number of lamps |
|--------------------|-----------------|
| 300 - 400 | 14 |
| 400 - 500 | 56 |
| 500 - 600 | 60 |
| 600 - 700 | 86 |
| 700 - 800 | 74 |
| 800 - 900 | 62 |
| 900 - 1000 | 48 |

Represent the above information with the help of a histogram.

**Or**

The mean of 14 values of a data is 23. If one more value is introduced in the data, the mean of 15 values becomes 25. Find the fifteenth value.

**20.** Solve for $x$ : $\dfrac{3x - 7}{5} - \dfrac{x + 1}{6} = \dfrac{2x + 2}{12} - 1$.

**Or**

Give geometric representation of $x + 3 = 0$ as an equation (i) in one variable (ii) in two variables.

**21.** A cylinder of maximum volume is cut off from a solid cuboid with square box of side 14 cm and height 20 cm. Find the volume of metal wasted.

**22.** In Fig 3, ABCD is a square, if $\angle PQR = 90°$ and PB = QC = DR, prove that QB = RC, PQ = QR, $\angle QPR = 45°$.
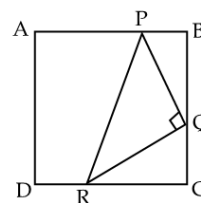


Fig 3

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**31.** The following values $x$ and $y$ are thought to satisfy a linear equation.

| $x$ | 1 | 2 |
|-----|---|---|
| $y$ | 1 | 3 |

Draw the graph, using the values of x and y.  At what points the graph cuts the $x$ – axis and $y$ – axis.

**32.** In Fig. 6, ABCD is a cyclic quadrilateral in which AB is produced to F and BE‖DC. If ∠FBE = 20° and ∠DAB = 95°, find ∠ADC.
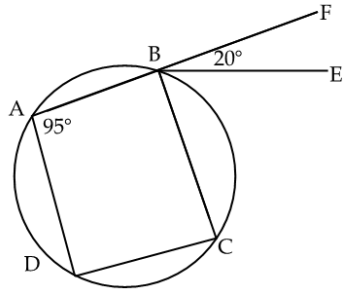


**33.** A cubical block of edge 22 cm is melted into small spherical balls of radius 1 cm.  Calculate the number of balls that can be made from it.

**34.** The following table gives the distribution of students of two sections according to the marks obtained by them.

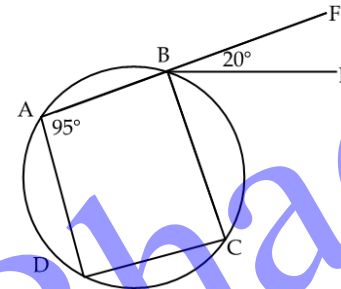| Section A | | Section B | |
|-----------|-----------|-----------|-----------|
| Marks | Frequency | Marks | Frequency |
| 0 - 10 | 3 | 0 - 10 | 5 |
| 10 - 20 | 9 | 10 - 20 | 19 |
| 20 - 30 | 17 | 20 - 30 | 15 |
| 30 - 40 | 12 | 30 - 40 | 10 |
| 40 - 50 | 9 | 40 - 50 | 1 |

Represent the marks of the students of both the sections on the same graph by two frequency polygons.  From the two polygons, compare the performance of the two sections.

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