Class 9th maths holiday homework for winter break

Number system chapter 1(9marks)

1. Write in the form of $\frac{p}{q}$ of the following

   $(i)0.\overline{6}$ $(ii)0.4\overline{7}$ $(iii)0.\overline{001}$ $(iv)0.2\overline{6}$

2. .Represent the real number $\sqrt{2},\sqrt{3},\sqrt{5}$ on a single number line.
3. Rationalize the denominator

   $\frac{1}{3-\sqrt{2}}$ (b) $\frac{3}{7-4\sqrt{3}}$
4. Simplify by using law of exponent

   $(i)\left(\frac{256}{6561}\right)^{\frac{3}{8}}$ $(ii)(15625)^{\frac{1}{6}}$ $(iii)\left(\frac{343}{1331}\right)^{\frac{1}{3}}$

   $(iv)\sqrt[8]{\frac{6561}{65536}}$ $(v)343^{-\frac{1}{3}}$

5. Represent $\sqrt{9.3}$ on number line
6. **Find the values of *a* and *b* in each of the following:**

   (i) $\frac{3+\sqrt{2}}{3-\sqrt{2}} = a + b\sqrt{2}$ **(ii)** $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a + b\sqrt{3}$

7. If $x = (3+\sqrt{8})$, find the value of $\left(x^2 + \frac{1}{x^2}\right)$.

Polynomials chapter 2(13)

1. : Find the value of each of the following polynomials at the indicated value of variables:

(i) $p(x) = 5x^2 - 3x + 7$ at $x = 1$.

(ii) $q(y) = 3y^3 - 4y + 11$ at $y = 2$.

(iii) $p(t) = 4t^4 + 5t^3 - t^2 + 6$ at $t = a$.

2 Verify whether the following are zeroes of the polynomial, indicated against them.

(i) $p(x) = 3x + 1$, $x = \frac{1}{3}$

(ii) $p(x) = 5x - \pi$, $x = \frac{4}{5}$

(iii) $p(x) = x_2 - 1$, $x = 1, -1$ (iv) $p(x) = (x + 1)(x - 2)$, $x = -1, 2$

3. Divide $p(x)$ by $g(x)$, where $p(x) = x + 3x^2 - 1$ and $g(x) = 1 + x$.

4. Factories $x^3 - 23x^2 + 142x - 120$.

5. Expand $(3a-7b-c)^2$

6. Factories:

(i) $4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$

7. Factorise $8a^3 - b^3 - 12a^2b + 6ab^2$

8. Factories $27x^3 + y^3 + z^3 - 9xyz$

Coordinate chap 3(4marks)

1. Write the quadrant and axis of the following points

(2,3) (-5,-6) (-4,3) (7,-8) (-4,0) (0,3) (2,2)(0,-5)

2. Show the point on the graph

(-2,-3) (3,0) (-4,-1) ,(-2,1),(5,-5)(-3,4)

Linear equation chap 4(10marks)

1. Write each of the following equations in the form $ax + by + c = 0$ and indicate the values of a, b and c in each case:

(i) $2x + 3y = 4.37$ (ii) $x - 4 = 3y$ (iii) $4 = 5x - 3y$ (IV) $2x = y$

2. Find two solutions for each of the following equations:

(i) $4x + 3y = 12$ (ii) $2x + 5y = 0$ (iii) $3y + 4 = 0$

3. Draw the graph of the following

(i) 2x+y =3 (ii) 3x+4y =6

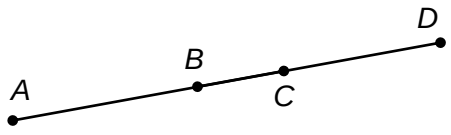
4. If $x = 2$, $y = 2$ is a solution of the equation $7x + py = 2$, find p.

5. Show that $(x = 1, y = 1)$ as well as $(x = 4, y = 13)$ is a solution of the equation $4x - y - 3 = 0$.

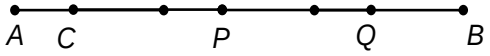
6. Find four solution of equation 3x+4y=6

5. INTRODUCTION TO EUCLID'S GEOMETRY(4)

1. **In figure, if *AC* = *BD*, then prove that *AB* = *CD*.**



2. **In figure, *AC = PQ* and *CP = BQ*, Prove that *P* is mid-point of the line segment *AB*.**



6.Line and angle(6marks)

1. In Fig. 6.13, lines AB and CD intersect at O. If $\angle AOC + \angle BOE = 70°$ and $\angle BOD = 40°$, find $\angle BOE$ and reflex $\angle COE$.

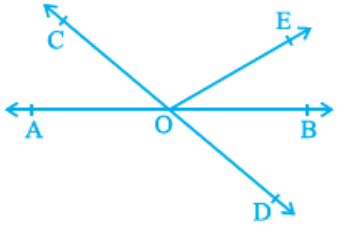
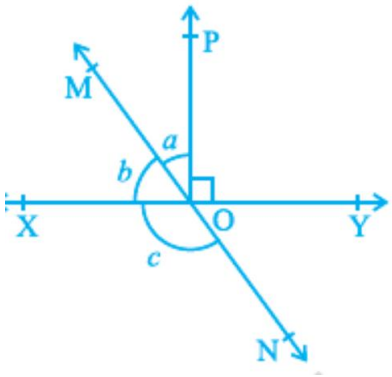


Fig. 6.13

2. In Fig. 6.14, lines XY and MN intersect at O. If



∠ POY = 90° and *a* : *b* = 2 : 3, find *c*.

3. If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel, then prove that the two lines are parallel

4.

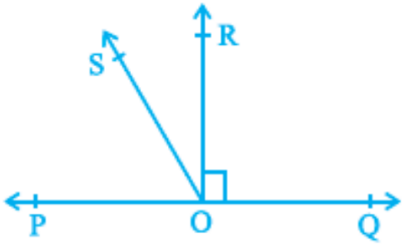


Fig. 6.17

3.

In Fig. 6.17, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that

$$\angle ROS = \frac{1}{2}(\angle QOS - \angle POS).$$

7. TRIANGLE(6)

1. Prove that Δ*ABC* is isosceles if any one of the following holds :

(i) Altitude *AD* bisects *BC*

(ii) Median *AD* is perpendicular to the base *BC*

2.Δ *ABC* is an isosceles triangle with *AB* = *AC*. Side *BA* is produced to *D* such that *AB* = *AD*. Prove that ∠*BCD* is a right angle.

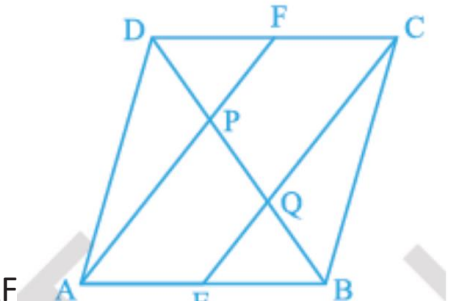
3. If Δ*ABC* is an isosceles triangle with *AB* = *AC*. Prove that the perpendiculars from the vertices *B* and *C* to their opposite sides are equal.

8. QUADRILATERAL(5marks)

1. If ratio of the angle of a quadrilateral are 3:4:5:6 then find each angle of a quadrilateral.
2. If the diagonals of a parallelogram are equal, then show that it is a rectangle.
3. ABCD is a rhombus and P, Q, R and S are the mid-points of the sides AB, BC, CD

and DA respectively. Show that the quadrilateral PQRS is a rectangle.

4. In a parallelogram ABCD, E and F are the mid-points of sides AB and CD respectively(see Fig. 8.31). Show that the line segments AF and EC trisect the diagonal BD



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9. Circle(6marks)

1.If the non parallel sides of a trapezium is equal, prove that it is a cyclic?

2.prove that a cyclic parallelogram is a rectangle?

4. In Fig. 10.38, $\angle ABC = 69°, \angle ACB = 31°$, find $\angle BDC$.

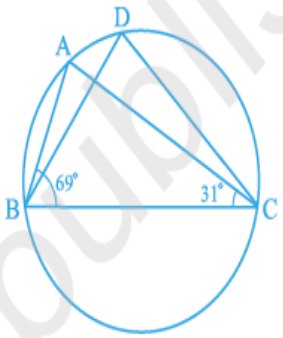
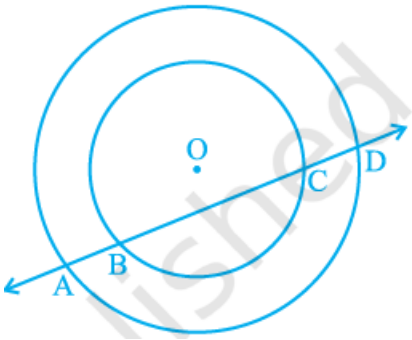
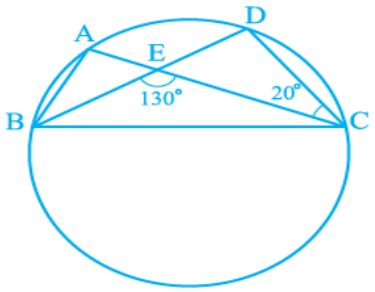


Fig. 10.38

3. If a line intersects two concentric circles (circles with the same centre) with centre O at A, B, C and D, prove that AB = CD



4. , A, B, C and D are four points on a circle. AC and BD intersect at a point E such that ∠ <BEC = 130° and ∠ <ECD = 20°. Find <BAC.



THEOREM

1. **Equal chords of a circle subtend equal angles at the Centre of the circle.**
2. **The angle subtended by an arc at the Centre is double the angle subtended by it at any point on the remaining part of the circle.**
3. **A diagonal of a parallelogram divides it into two congruent triangles.**

10. Herons formula(7marks)

16. Find the area of a triangle, two sides of which are 8 cm and 11 cm and the perimeter is 32 cm.

17. A triangle has sides 35 cm, 54 cm and 61 cm long. Find its area. Also find smallest of its altitudes.

18. The sides of a triangular plot are in the ratio 3 : 5 : 7 and its perimeter is 300 m. Find its area.

19. A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 26 cm, 28 cm and 30 cm, and the parallelogram stands on the base 28 cm, find the height of the parallelogram.

20. A rhombus shaped field has green grass for 18 cows to graze. If each side of the rhombus is 30 m and its longer diagonal is 48 m, how much area of grass field will each cow be getting?

21. Sides of a triangle are in the ratio of 12 : 17 : 25 and its perimeter is 540cm. Find its area.

22. The base of an isosceles triangle is 10 cm and one of its equal sides is 13 cm. Find its area.

11.Surface area and volume(7marks)

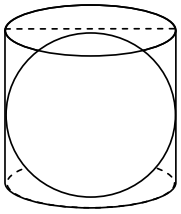
1. A conical tent is 10 m high and the radius of its base is 24 m. Find
(i) Slant height of the tent.
(ii) Cost of the canvas required to make the tent, if the cost of 1 m^2 canvas is ` 70.

2.The height of a cone is 16 cm and its base radius is 12 cm. Find the curved surface area and the total surface area of the cone ($\pi = 3.14$).

3. **The radius and height of a cone are in the ratio 4 : 3. The area of the base is 154 cm^2. Find the area of the curved surface**

4. **A hemispherical dome of a building needs to be painted (figure). If the circumference of the base of the dome is 17.6 m, find the cost of painting it, given the cost of painting is Rs 5 per 100 cm^2.**

5. A right circular cylinder just encloses a sphere of radius r (figure). Find



(i) surface area of the sphere

(ii) Curved surface area of the cylinder,

(iii) ratio of the areas obtained in (i) and (ii).

12.Statistics(6marks)

5. Draw a histogram and a frequency polygon for the following data :

Marks	10-20	20-30	30-40	40-50	50-60
No. of students	8	12	15	9	6

6. Draw a histogram for the following data :

Classes	10-15	15-20	20-30	30-50	50-80
Frequency	6	10	10	8	18

7. Find the mean of the following data :

153, 140, 148, 150, 154, 142, 146, 147

8. The mean of the following data is 37. Find x

28, 35, 25, 32, x, 40, 45, 50

27. The runs scored by two teams A and B on the first 60 balls in a cricket match are given below: Represent the data of both the teams on the same graph by frequency polygons.

Number of balls	Team A	Team B
1 - 6	2	5
7 - 12	1	6
13 - 18	8	2
19 - 24	9	10
25 - 30	4	5
31 - 36	5	6
37 - 42	6	3
43 - 48	10	4
49 - 54	6	8
55 - 60	2	10

9. For the year 1970 – 71, weekly cost of living index was recorded from a register in the record room of the ministry of labour. The data recorded is as under :

Cost of living index :	140–150	150–160	160–170	170–180	180–190	190–200
No. of weeks	5	10	20	10	5	2