SCHEDULE OF MENTAL MATHS QUIZ COMPETITIONS FOR THE YEAR 2010-11

Practice to students from Question Banks	01.04.10 to 22.10.10
School level Quiz Competition	23.10.10 to 25.10.10
Cluster level Quiz Competition	22.11.10 to 25.11.10
Zonal level Quiz Competition	01.12.10 to 04.12.10
District level Quiz Competition	10.01.11 to 12.01.11
Regional level Quiz Competition	14.01.11 to 15.01.11
State level Quiz Competition	First week of February, 2011

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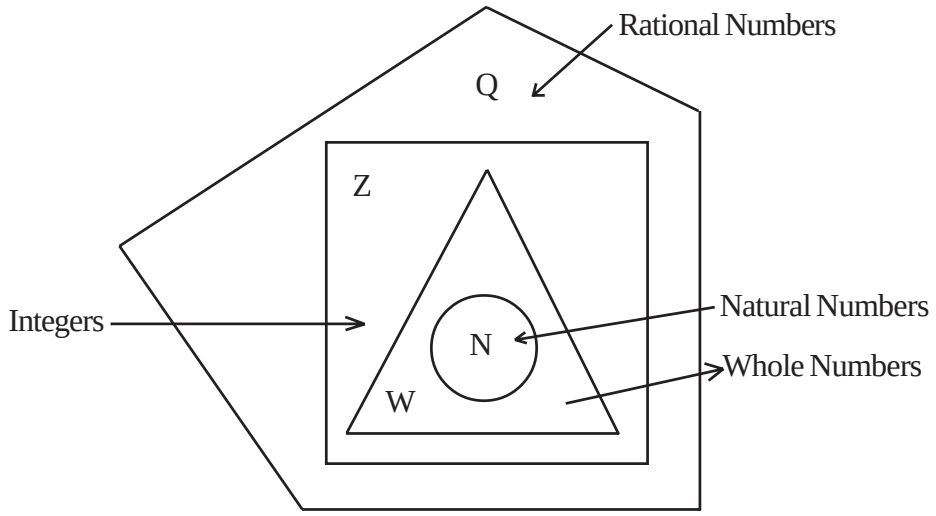
Class - IX

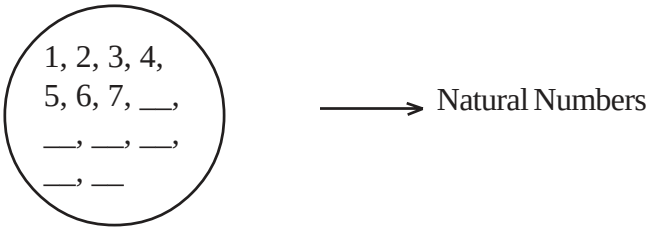
MATHEMATICS

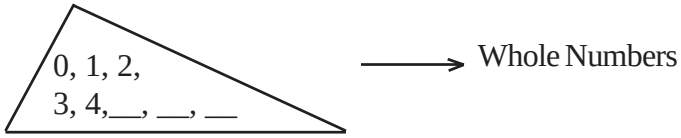
INDEX

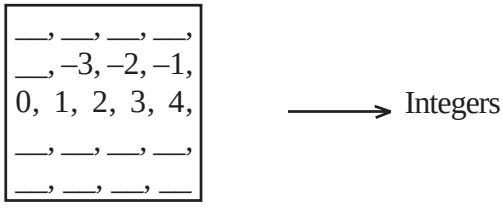
CHAPTER-1

Number System









1. Rational number is a number in the form of p/q, where p and q are integers and $q \neq 0$

   Note that decimal representation of rational number is either terminating or non terminating but recurring.

2. A real number which is not a rational number is called an irrational number. Decimal

form of irrational number is neither terminating nor recurring. Thus, Real number = Rational numbers + Irrational numbers.

3. If r, is a rational number and s is a irrational number, then their sum, (r+s), difference (r–s), products (rs) and quotient (r/s) are irrational numbers.

4. For positive real numbers a and b :–

(i) $\sqrt{ab}$ $\sqrt{a}.\sqrt{b}$

(ii) $\sqrt{\frac{a}{b}}$ $\frac{\sqrt{a}}{\sqrt{b}}$

(iii) $(\sqrt{a}$ $\sqrt{b})(\sqrt{a}-\sqrt{b})$ $a-b$

(iv) $(a$ $\sqrt{b})(a-\sqrt{b})$ a^2-b

(v) $(\sqrt{a}$ $\sqrt{b})^2$ a $2\sqrt{ab}$ b

5. To rationalise the denominator of $\frac{1}{\sqrt{a}\ \ b}$, multiply this by $\frac{\sqrt{a}-b}{\sqrt{a}-b}$, where a and b are integers.

6. Laws of indices

(i) $a^p.a^q$ $a^{p\ q}$

(ii) $a^{p\ \ q}$ a^{pq}

(iii) $\frac{a^p}{a^q}$ a^{p-q}

(iv) a^pb^p $(ab)^p$

Where, a>0 and a real number and p and q are rational numbers.

CHAPTER-1

Number System

1. Simplify $\sqrt[4]{32}$

2. Which is greater $\sqrt[3]{3}$ and $\sqrt[4]{5}$?

3. Write in ascending form $\sqrt[3]{4}, \sqrt[3]{2}, \sqrt[3]{3}$?

4. Simplify $\sqrt{8}+\sqrt{32}-\sqrt{2}$

5. Multiply $\sqrt[3]{7}$ by $\sqrt{2}$

6. Divide $\sqrt{24}$ by $\sqrt[3]{200}$

7. What is value of $\left(8^{3/5}\right)^5$?

8. What is value of $4^{1/5}\ \ 8^{1/5}$?

9. What is value of $8^{1/5} \div 8^{1/3}$?

10. Simplify $6^3 \times \left(\frac{1}{2}\right)^3$

11. What is pure surd of $\frac{3}{4}\sqrt{32}$?

12. Write into simplest form $\sqrt[5]{3125}$

13. Simplify $4\sqrt{3}+\sqrt{27}$

14. Find two rational numbers between $\frac{1}{2} and \frac{1}{4}$

15. Find the two rational numbers between -1 and $\frac{3}{2}$

16. Find three rational numbers -5 and $\frac{3}{4}$

17. Find four rational numbers between -1 and 1

18. Express $.\overline{37}$ in the form of $\frac{p}{q}$.

19. Express $.\overline{54}$ in the form of $\frac{p}{q}$.

20. Express $3.\overline{14}$ in the form of $\frac{p}{q}$.

21. What is the correct approximate decimal representation of $\sqrt{3}$ upto two decimals.

22. Express $\sqrt[3]{-108a^4b^3}$ in the simplest form

23. Express $\sqrt[4]{a^8b^6}c^7$ in th simplest form.

24. What is the decimal representation of $3\frac{3}{8}$.

25. What is the decimal representation of $\frac{5}{6}$.

26. Give the decimal representation of $\frac{327}{500}$.

27. Find three rational numbers between 0 and $\frac{1}{10}$.

28. What is the rational denominator of $\frac{1}{\sqrt{3}+\sqrt{2}}$

29. If $\sqrt{3}$ = 1.732, what is the value of $\frac{2}{\sqrt{3}}$.

30. Express $\frac{4}{\sqrt{5}-1}$ with rational denominator.

31. Express $\frac{10}{\sqrt{7}-\sqrt{5}}$ with rational denominator.

32. Express $\frac{16}{\sqrt{41}-5}$ with a rational denominator.

33. Find the value of $(512)^{\frac{-2}{9}}$.

34. Find the value of $(125)^{\frac{2}{9}}$

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

36. Which of the following is rational or irrational number.

(i) $\left(2+\sqrt{3}\right)^2$ (ii) $\left(3+\sqrt{4}\right)^2$

37. If P = $3-2\sqrt{2}$, what is the value of $P^2+\frac{1}{P^2}$.

38. Express as a pure Surd: $2xy\sqrt[3]{xy}$.

39. Express as pure surd : $a^{\frac{1}{2}}\ \sqrt[3]{ab^2}$.

40. Find the value of $4\sqrt{12}\times 7\sqrt{6}$

41. Simplify $\sqrt{\frac{27}{80}}$.

42. Find the value of $\frac{1}{\sqrt{10}}$ when $\sqrt{10}=3.162$.

43. If x = $7+4\sqrt{3}$, what is the value of $\sqrt{x}+\frac{1}{\sqrt{x}}$.

44. Find three rational numbers between 0 and 1.

45. What is the value of $\frac{2+\sqrt{3}}{2-\sqrt{3}}$.

46. What is the value of $\frac{1}{3+\sqrt{2}}$?

47. Find the value of $\sqrt{8}\times\sqrt{50}$.

48. If $\sqrt{2}$ =1.41, find the value of $\frac{1}{\sqrt{2}}$.

49. Divide $\sqrt{162}$ by $\sqrt{2}$.

50. Find the rationalising factor of $\sqrt[3]{49}$.

51. What is the value of $7\sqrt{6}\quad 5\sqrt{24}$.

52. If $\sqrt{3}$ =1.732, what is the value of $\frac{5}{\sqrt{3}}$?

53. If $\sqrt[3]{2}=(x)^{\frac{1}{2}}$, what is the value of x?

54. If $\left(\sqrt[4]{49}\right)=x^{\frac{1}{2}}$, what is the value of x?

55. What is the value of $3\sqrt{5}\quad 2\sqrt{3}\quad 3\sqrt{5}\quad 2\sqrt{3}$?

CHAPTER 1
Answer
(Number System)

1. $2\sqrt[4]{2}$
2. $\sqrt[4]{5}$
3. $\sqrt[3]{2}, \sqrt[3]{3}, \sqrt[3]{4}$
4. $5\sqrt{2}$
5. $\sqrt[6]{392}$
6. $\sqrt[6]{\frac{216}{625}}$
7. 512
8. 2
9. $8^{-2/15}$ or $2^{-2/5}$
10. 27
11. $\sqrt{18}$
12. 5
13. $7\sqrt{3}$
14. $3/8, 7/16$
15. $\frac{-15}{16}, \frac{23}{16}$
16. $-17/8, -57/16, \frac{-45}{32}$
17. $0, \frac{-1}{2}, \frac{1}{2}, \frac{3}{4}$
18. $\frac{37}{99}$
19. $\frac{6}{11}$
20. $\frac{311}{99}$
21. 1.73
22. $-3ab\sqrt[3]{4a}$
23. $a^2bc\sqrt[4]{b^2c^3}$
24. 3.375
25. $0.8\overline{3}$
26. 0.654
27. $1/40, 1/20, 3/40$
28. $\sqrt{3}-\sqrt{2}$
29. 1.154
30. $\sqrt{5}+1$
31. $5\left(\sqrt{7}+\sqrt{5}\right)$
32. $\sqrt{41}+5$
33. $\frac{1}{4}$
34. $\sqrt[3]{25}$
35. 4
36. Irrational, rational
37. 34
38. $\sqrt[3]{8x^4y^4}$
39. $\sqrt[3]{a^{5/2}b^2}$
40. $168\sqrt{2}$
41. $\frac{3}{20}\sqrt{15}$
42. 0.316
43. 4
44. $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$
45. $7+4\sqrt{3}$
46. $\frac{3-\sqrt{2}}{7}$
47. 20
48. .705
49. 9
50. $\sqrt[3]{7}$
51. 420
52. 2.886
53. $\sqrt[3]{4}$
54. 7
55. 33

CHAPTER-2

Polynomials

- All the algebric expressions having only whole numbers as the exponents of the variable. Such expressions in this form are called polynomials in one variable.

- A polynomial of one term is callled a monomial.

- A polynomial of two terms is called a bionomial.

- A polynomial of three terms is called a trinomial.

- A polynomial of degree one is called a linear polynomial.

- A polynomial of degree two is called a quadratic polynomial.

- A polynomial of degree three is called a cubic polynomial.

- A real number 'a' is a zero of a polynomial p(x) if p(a) = 0. In this case, a is called also root of the equation p(x)=0

- The highest power of the variable in the polynomial is called degree of the polynomial.

- The degree of non zero constant polynomial is zero.

- If p(x) is any polynomial of degree greater then or equal to 1 and p(x) is divided by the linear polynomial (x–a), then the remainder is p(a). This is called Remainder Theorem.

- If x–a is a factor of the polynomial p(x), then p(a)=0. This is known as Factor Theorem.

◆ (i) $(x \quad y \quad z)^2 \quad x^2 \quad y^2 \quad z^2 \quad 2xy \quad 2yz \quad 2zx$

(ii) $(x \quad y)^3 \quad x^3 \quad y^3 \quad 3xy(x \quad y)$

(iii) $(x-y)^3 \quad x^3-y^3-3xy(x-y)$

(iv) $x^3-y^3 \quad (x-y)[(x-y)^2 \quad 3xy] \quad (x-y)(x^2 \quad xy \quad y^2)$

(v) $x^3 \quad y^3 \quad (x \quad y)[(x \quad y)^2-3xy] \quad (x \quad y)(x^2-xy \quad y^2)$

(vi) If, $a+b+c = 0$, then $a^3+b^3+c^3 = 3abc$

(vii) $x^2 \quad \frac{1}{x^2} \quad x-\frac{1}{x}^{\,2} \quad 2$

(viii) $x^2 \quad \frac{1}{x^2} \quad x \quad \frac{1}{x}^{\,2} \quad -2$

(ix) $x^2 \quad y^2 \quad z^2 \quad (x \quad y \quad z)^2-2(xy \quad yz \quad zx)$

$x^3 \quad y^3 \quad z^3-3xyz \quad (x \quad y \quad z)(x^2 \quad y^2 \quad z^2-xy-yz-zx)$

$(x \quad y \quad z)\{(x \quad y \quad z)^2-3(xy \quad yz \quad zx)\}$

(x) $x^3-\frac{1}{x^3} \quad x-\frac{1}{x} \quad x-\frac{1}{x}^{\,2} \quad 3$

(xi) $x^3 \quad \frac{1}{x^3} \quad x \quad \frac{1}{x} \quad x \quad \frac{1}{x}^{\,2} \quad -3$

(xii) $x^4 \quad \frac{1}{x^4} \quad x^2 \quad \frac{1}{x^2}^{\,2} \quad -2$

(xiii) $\sqrt{x} \quad \frac{1}{\sqrt{x}} \quad \sqrt{x \quad \frac{1}{x} \quad 2}$

(xiv) $\sqrt{x}-\frac{1}{\sqrt{x}} \quad \sqrt{x \quad \frac{1}{x}-2}$

CHAPTER-2

Polynomials

1. What is the degree of the polynomial $4-y^2$?

2. What is the degree of the polynomial $5x^3+4x^2+7x$?

3. Whether the following polynomials are linear, quadratic or cubic polynomials.

   (i) $x-x^3$ (ii) $y+y^2+4$ (iii) 3t

4. What is the value of the polynomial $-4x^2+7x-5$ when x = –3?

5. If f(x) = $2x^3-3x^2+12$ then find f(2).

6. What is the degree of the polynomial $\left(y^3-2\right)\left(y^2+11\right)$.

7. If P(y) = y^2-y+1 then what is value of P(3).

8. What is the zero of the polynomial P(x) = x+5?

9. What is the Coefficient of x in the expression $\frac{x}{2}+y+Z$?

10. What is the Coefficient of x in the expression $x^2 \quad \sqrt{5}x \quad 2$?

11. What is the degree of the polynomial 20?

12. What is the standard form of $y^2+6y+9+4y^4$?

13. What is the standard form of $q^2+4q^8-q^6$?

14. What is the remainder when p(x)= x^3-ax^2+6x-a is divided by x – a?

15. Find the remainder when $x^{51}+51$ is divided by x + 1.

16. Find the value of K if x + 3 is a factor of $3x^2+kx+6$.

17. Express $8x^3+60x^2+150x+125$ as a cube of binomial.

18. Factorize $9p^2-16q^2$.

19. Facrorize $x\left(x^2+y^2-z^2\right)-z\left(x^2+y^2-z^2\right)$.

20. Expand $(x+5y)^3$.

21. Expand $(2x-7)^3$.

22. Expand $(3x-1)^2$.

23. Expand $(x+2)^2$.

24. Factorize $50x^2 - 72y^2$.

25. Factorize $m^2+2\sqrt{3}m+3$.

26. Find the zeros of polynomials $x^2+14x+40$.

27. What is the product of Zero's of polynomials $(x+8)(x-10)$.

28. Facroeize $9x^2-\frac{y^2}{100}$

29. What is the degree of polynomial $4y^2-4y+1$.

30. Factorize $8a^3-b^3-12a^2b+6ab^2$.

31. Factorize $8x^3+27y^3+36x^2y+54xy^2$

32. Factorize $36a^2+60ab+25b^2$.

33. Find the product $(x-5)(x+4)$.

34. Find the product $(x-3)(x-7)$.

35. Find the product $(x+6)(x+8)$.

36. Find the remainder when p(x) = x^3+x^2+x+1 is divided by g(x) = x+1.

37. If p(x) = $x^4+3x^3+3x^2+x+1$ and g(x) = x+1 then find the remainder when p(x) is divided by g(x).

38. Find the value of K if x - 2 is the factor of x^3-2x^2-x+k.

39. Find the value of K if x + 1 is the factor of x^3-kx^2-9x-5.

40. Find the value of K if x - 1 is factor of $3x^4 - kx^3 - 3x + 4$.

41. Find the value of K if x + 1 is facror of $3x^2 + x + k$.

42. What is the Coefficient of x^2 in the polynomial $3x^3 - 15x^2 + 10x - 2$.

43. Find the value of p(x) = $x^2 - 4x + 7$ when x = 3.

44. Find the value of $f\left(\frac{-3}{2}\right)$ when f(x) = $4x^2 + 3x + \frac{7}{2}$.

45. If f(x) = $x^2 - 5x - 14$ find the value of f(7).

46. Find the zeros of the polynomial $x^2 - 15x - 34$.

47. What should be added to the polynomial $x^2 \quad 5x \quad 4x$. so that 3 is a zero of the polynomial.

48. Which of the number 3,2,-2,1 are zeros of the polynomial $x^2 - 4$?

49. Find the quotient when $x^2 - 7x + 12$ is divided by (x - 3).

50. Find the polynomial whose zeros are $\sqrt{2}$ and $-\sqrt{2}$.

CHAPTER 2
Answer
(Polynomials)

1. 2
2. 3
3. (i) Cubic (ii) Quadratic
   (iii) linear
4. -62
5. 16
6. 5
7. 7
8. -5
9. $\frac{1}{2}$
10. $-\sqrt{5}$
11. zero
12. $4y^4+y^2+6y+9$
13. $4q^8-q^6+q^2$
14. 5a
15. 50
16. 11
17. $(2x+5)^3$
18. $(3p+4q)(3p-4q)$
19. $(x-z)\left(x^2+y^2-z^2\right)$
20. $x^3+125y^3+15x^2y+75xy^2$
21. $8x^3-343-84x^2+294x$
22. $9x^2-6x+1$
23. x^2+4x+4
24. $2(5x+6y)(5x-6y)$
25. $\left(m+\sqrt{3}\right)^2$
26. $(-4,-10)$
27. -80
28. $\left(3x+\frac{y}{10}\right)\left(3x-\frac{y}{10}\right)$
29. 2
30. $(2a-b)^3$
31. $(2x+3y)^3$
32. $(6a+5b)^2$
33. x^2-x-20
34. $x^2-10x+21$
35. $x^2+14x+48$
36. 0
37. 1
38. k = 2
39. k = 3
40. k = 4
41. k = -2
42. -15
43. 4
44. 8
45. 0
46. 17, -2
47. 2
48. 2, -2
49. x - 4
50. x^2-2

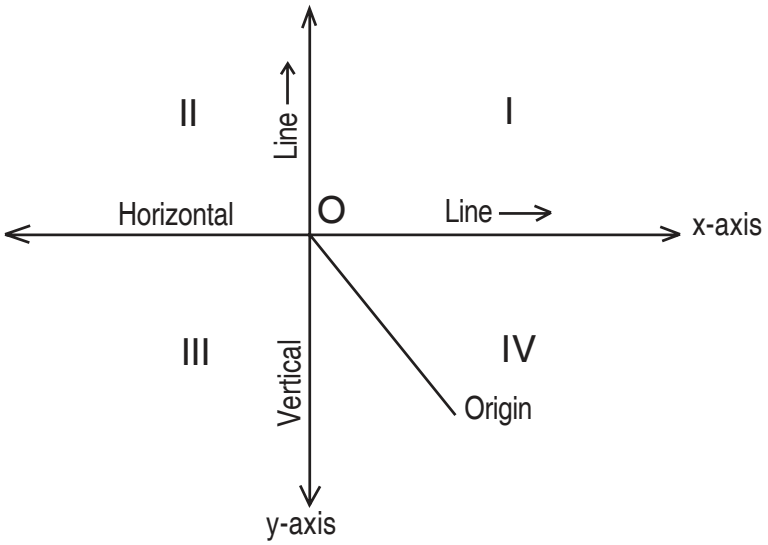
CHAPTER-3

Co-ordinate Geometry

- To locate the position of an object or a point in a plane, we require two prependicular lines. One of them is horizontal and the other is vertial.

- The plane is called the cartesian or coordinate plane.

- The horizontal line is called the x-axis, and the vertical line is called the y-axis.



Quadrant
I
II
III
IV

- The x and y axis divide the plane into four parts called quadrants.

- The point of intersection of the axis is called the origin.

- The distance of the point from the y-axis is called its x-coordinate, or abscissa, and the distance of the point from the x-axis is called its y-coordinate or ordinate.

- The coordinates of a point on the x-axis are of the form (x,0) and that of the point on the y-axis are (0,y)

- The coordinates of the origin are (0,0)

- The coordinates of a point in quadrants :–
  (i) I Quadrant (+,+)
  (ii) II Quadrant (–,+)
  (iii) III Quadrant (–,–)
  (iv) IV Quadrant (+,–)
  where, + denotes a positive real number and – denotes a negetive real number.

- The equation of x-axis is y=0.

- The equation of y-axis is x=0.

- If, $(x \quad y)$
  then $(x, y) \quad (y, x)$
  and if x = y then
  (x,y) = (y,x)

CHAPTER-3

Co-ordinate Geometry

1. Name the mathematician who developed Co-ordinate geometry.
2. How many points are required to locate a line segment?
3. The axis divide the plane into four parts. What these four parts called?
4. What are the co-ordinates of origin?
5. What is the point of intersection of axis called?
6. What is the distance of a point form y -axis called?
7. What is the distance of a point from x-axis called?
8. What is the name of the horizontal and vertical lines drawn to determine the position of any point to the cartesian plane?
9. What is the equation of x -axis?
10. Line y = 0 represents which axis?
11. Line y = 2 is parallel to which axis?
12. Line x = -3 is parallel to which axis?
13. What is the perpendicular distance of the point P(4,3) from x-axis?
14. What is the perpendicular distance of the point Q(5,7) from y-axis?
15. Which of the following points lie in the fourth quadrant (-3, -5) , (2, -1) , (-2, 4) , (4, -7), (5, 6)?
16. Name the figure obtained by joining the points (0, 0), (5, 0), (5,5), (0,5) in the cartesian plane.
17. Name the figure obtained by joining the points (0, 0), (5, 0), (5,3) and (0,3) in the cartesian plane.
18. Name the figure obtained by joining the points (-5, 0), (0,5) and (5,0) in the cartesian plane.
19. Name the axis on which the point (7, 0) lie.
20. Name the axis on which the point (0, 9) lie.
21. Find the co-ordinates of the point whose abscissa is 9 and ordinate is -2.
22. Find the co-ordinates of the point whose ordianate is 3 and lies on x - axis.

23. Find the co-ordinates of the point whose abscissa is -3 and lies on x - axis..

24. Name the quadrant in which the point (-2,4) lies.

25. If the points P(1,0), Q(5,0), R(5,2) and S forms a rectangle. Then find the fourth vertex S.

26. If the points A(0,0), B(2,0), C(2,2) are three vertices of a square then find the fourth vertex of the square.

27. Which of the following points lie on x-axis

    (i) (3,0)

    (ii) (2,-3)

28. If the point (x,y) lies on x-axis then what is the value of y?

29. If the point (x,y) lies on y-axis then what is the value of x?

30. Find the co-ordinate of the point whose abscissa is $\frac{9}{2}$ and ordinate is 5.

31. Find the co-ordinate of the point whose abscissa is 3and ordinate is $\frac{7}{2}$.

32. Which of the following point lies on x-axis.

    (i) (0,-2)

    (ii) (-2, 0)

33. Which of the following point lies on y-axis.

    (i) (0,-3)

    (II) (2, -3)

34. Which of the following point lies on x-axis.

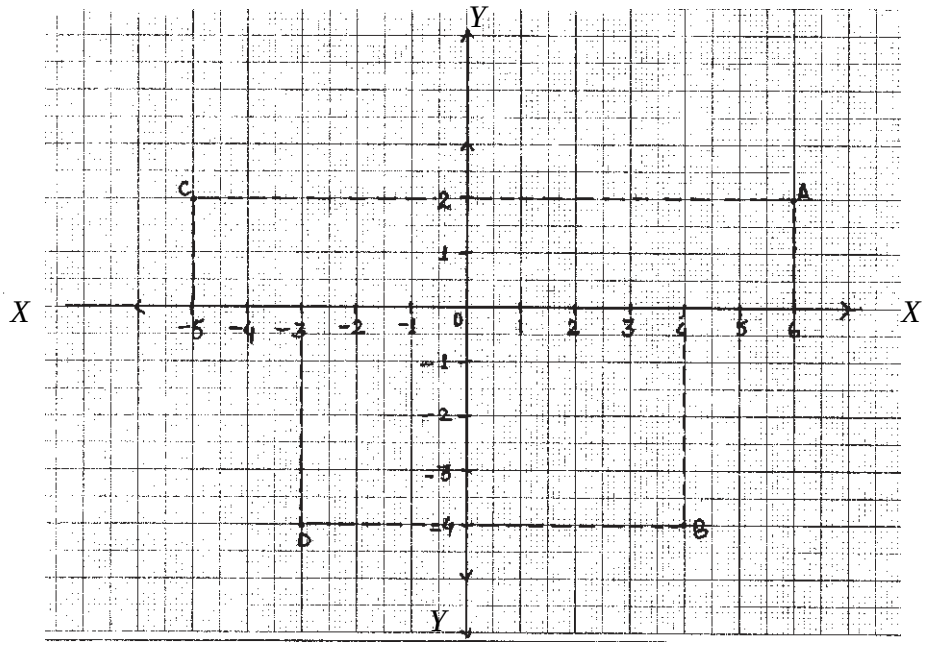
    (i) (0,0)

    (II) (5, 0)

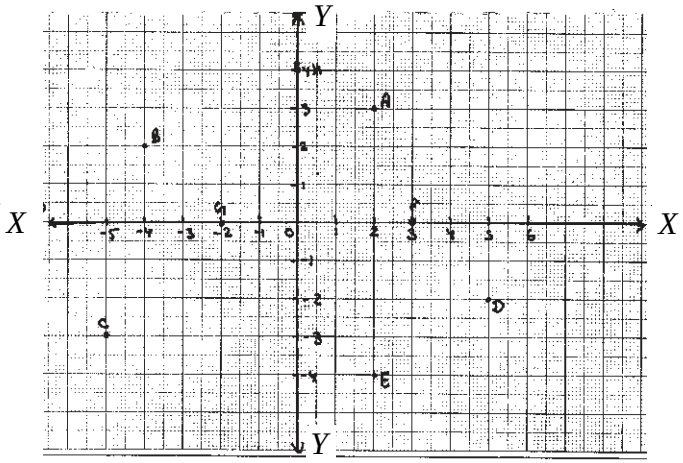
35. A point lies on x-axis at a distance of 6 units from y -axis and lies on right side of origin. Find the co-ordinates of the point..

36. A point lies on y-axis at a distance of 1 units from x -axis and lies above x-axis. Find the co-ordinates of the point..

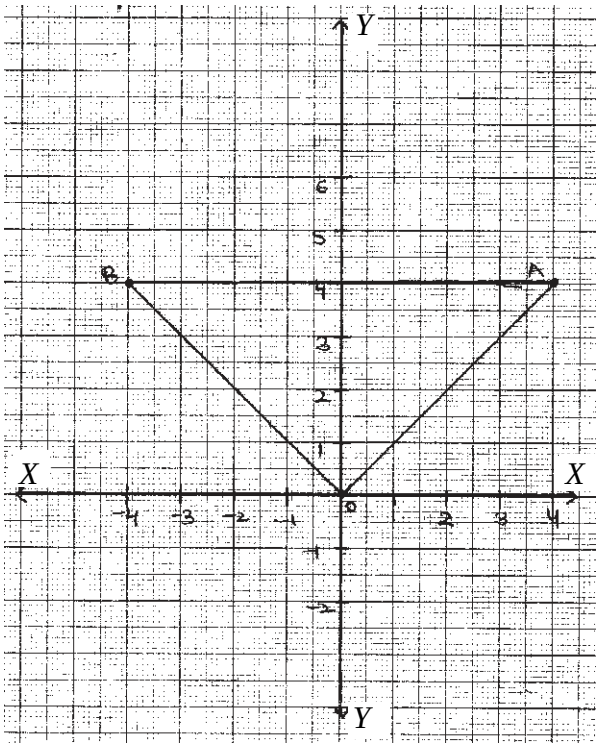
37 Write down the co-ordinates of point A,B,C,D



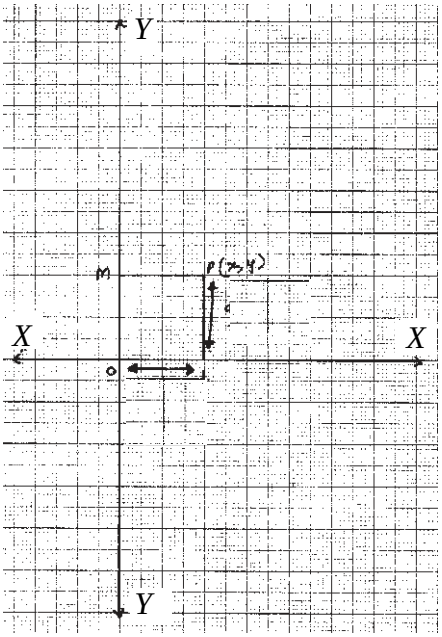
38. Write down the co-ordinates of point A,B,C,D,E,F, G and H.



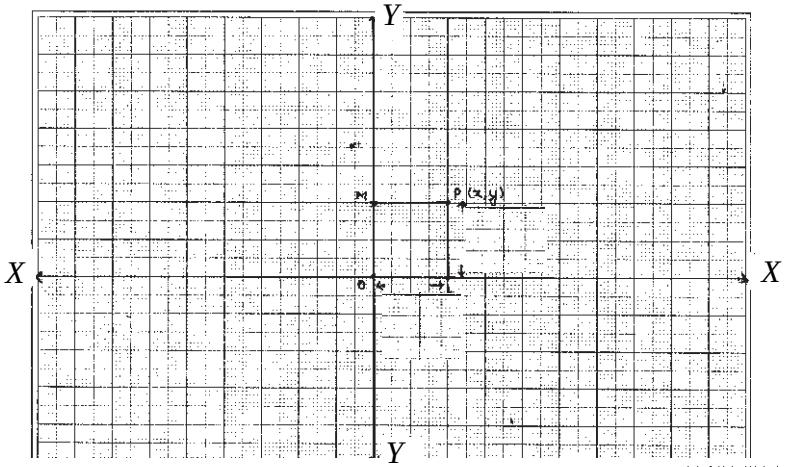
39. What figure do you obtain. Also find the co-ordinates of the vertices A, B, C.



40. In the figure what is the perpendicular distance of the point P from the y axis measured along the positive direction of x axis.



41. In the figure what is the perpendicular distance of the point P from the x axis measured along the positive direction of y axis.



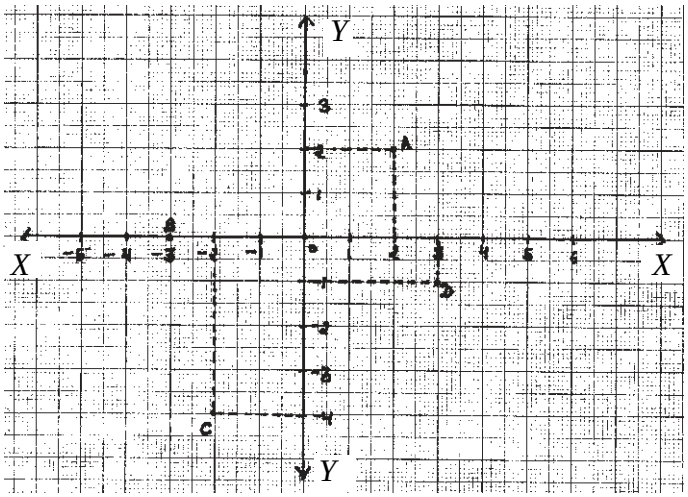
42. In the given figure find

(i) The co-ordinates of A

(ii) The co-ordinates of B

(iii) The co-ordinates of C

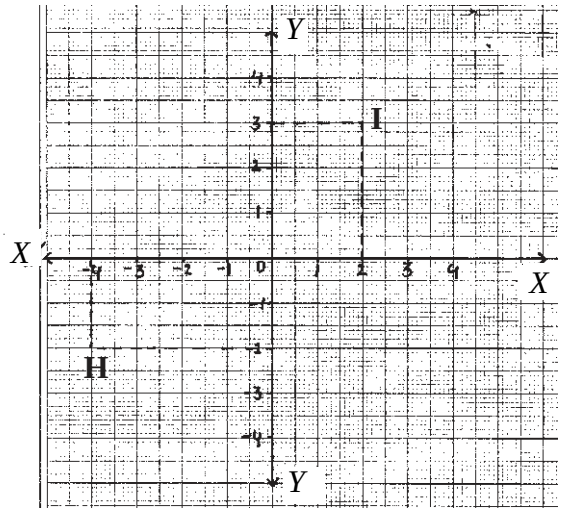
(iv) The co-ordinates of D



43. In the given figure find

(i) The ordinate of the point H

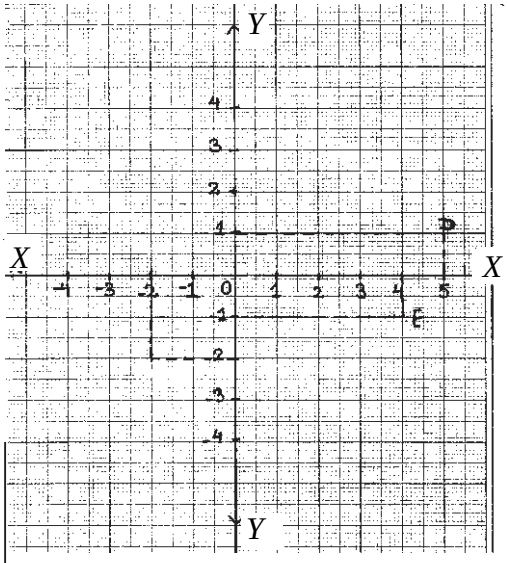
(ii) The ordinate of the point I.



44. In the given figure find

(i) The abscissa of the point D

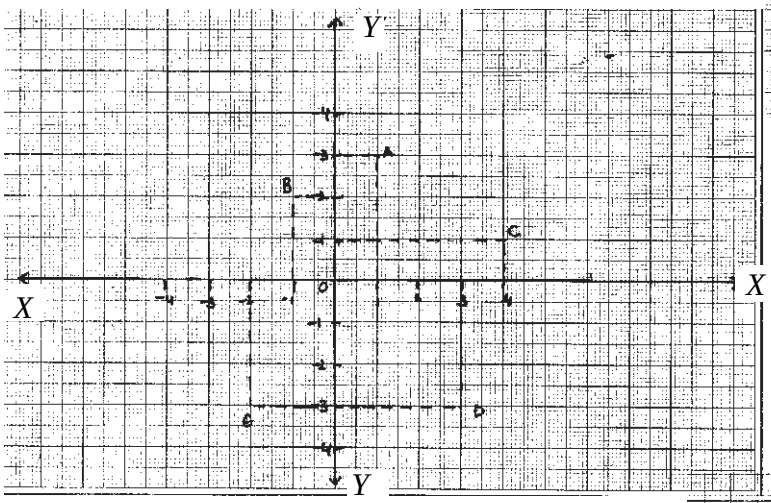
(ii) The abscissa of the point E



45. In the given figure find

(i) The Point identified by the co-ordinate of (-2,-3)

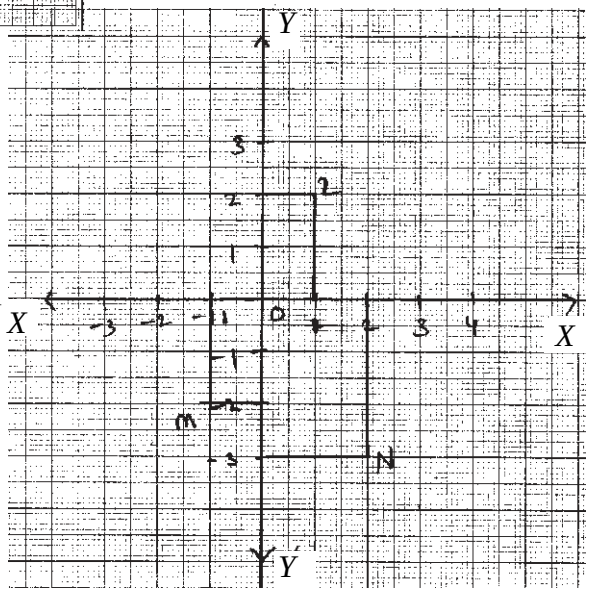
(ii) The Point identified by the co-ordinate of (3,-3).



46. In the given figure find

(i) The co-ordinate of the point L

(ii) The co-ordinate of the point M



47. Name the quadrant in which the following points lie?

(i) (-7, -5) (ii) (2, -9)

(iii) (9, 0) (iv) (0, 5)

CHAPTER 3
Answer
(Co-ordinate Geometry)

1. Rene Descrete
2. Two
3. Quadrants
4. (0, 0)
5. Origin
6. Abscissa
7. Ordinate
8. x-axis and y - axis
9. y = 0
10. x - axis
11. x - axis
12. y - axis
13. 3 units
14. 5 units
15. (2, -1) & (4, -7)
16. Square
17. Rectangle
18. Traingle
19. x - axis
20. y-axis
21. (9, -2)
22. (0, 3)
23. (-3,0)
24. II quadrant
25. (1,2)
26. (0, 2)
27. (3, 0)
28. y = 0
29. x = 0
30. (4.5, 5)
31. (3, 3.5)
32. (-2, 0)
33. (0, -3)
34. (5, 0)
35. (6, O)
36. (0, 1)
37. A(6, 2), B(4, -4) , C(-5, 2), D(-3, -4)
38 A(2, 3), B(-4, 2) , C(-5, -3), D(5, -2), E(2, -4), F(3,0), G (-2, 0), H(0, 4)
39. Traingle B(-4,4) A(4,4), C(0,0)
40. X-co-ordinate or abscissa
41. Y-co-ordinate or ordinate
42. A(2, 2), B(-3, 0) , C(-2, -4), D(3, -1)
43. (i) -2, (ii) 3
44. (i) 5 (ii) 4
45. (i) E (ii) D
46. L(1,2) (ii) M(-1, -2)
47. (i) 3rd Quadrant
    (ii) 4th Quadrant
    (iii) x-axis
    (iv) y-axis

CHAPTER-4

Linear Equation in Two Variable

- An equation of the form ax+by+c=0, where a, b and c are real numbers, such that a and b are not both zero, is called a linear equation in two variables.

- A linear equation in two variables has infinitely many solutions.

- The graph of every linear equations in two variables is a straight line.

- The graph of x=a is a straight line parallel to the y-axis.

- The graph of y=a is a straight line parallel to the x-axis

- Every solution to the linear equation is a point on the graph of the linear equation.

CHAPTER-4

Linear Equation in Two Variable

1. What is an equation?
2. What is a linear equation in one variable?
3. How many solutions does a linear equation in one variable has?
4. What is a linear equation in two variables?
5. How many solutions does a linear equation in two variables have?
6. What is the value of y in terms of x.

   $ax + by + c = 0, \qquad (a \neq 0, b \neq 0)$

7. What is the y-form of the equation $x - 2y = 4$.
8. What is the x-form of the equation $2x + 5y = 9$.
9. What is the x-form of the equation $\pi x + y = 9$.
10. Compare the linear equation $3x \quad 8 \quad \sqrt{2}y$ with $ax + by + C = 0$ and indicate the values of a,b and c.
11. Compare $2x = -6y$ with $ax + by + C = 0$, and indicate the values of a,b and c.
12. Express $x - \frac{y}{5} - 10 = 0$ in the form of $ax + by + C = 0$, and indicate the values of a, b and c.
13. Express x=-9 as a linear equation in two variables.
14. Express 3y =7 as a linear equation in two variables.
15. Express 5y =2 as a linear equation in two variables.
16. Find whether x = 2 , y = 1 is a solution of a linear equation 5x + 3y = 14.
17. Verify whether x = 12 is a solution of the eqution $0.5x + \frac{x}{3} = 0.25x + 9$.
18. Examine if x = 0 is a solution of the equation (x - 2) + (x + 3) = x + 8.
19. Verify if x = 2 is a solution of the equation $\frac{3x-1}{4} + \frac{3}{4} = 2$.

20. Examine if 3 is a solution of x - 7 = 3x + 8.

21. Find the coordinates of the points where the equation 3x + y = 6 intersects both the axis.

22. Find the coordinates of the points where the equation y - 3x = 9 intersects both the axis.

23. Does the point (4,1) lies on the equation 2x + 5y = 13?

24. Find the coordinates of the points where the equation 2x - 3y = 6 intersects x-axis and y-axis.

25. Find any two solutions for the following linear equations in two variables:

(i) 2x + 5y = 13 (ii) x + y + 4 = 0 (iii) (x - 4) - y + 4 = 0

Find the value of 'p' so that the following equations may have x= 1, y = 1 as a solution:
(26) 3x + py = 6 (27) px - 2y = 10 (28) 5x + 2py = 3a

Represent the given statements as a linear equations in two variables.

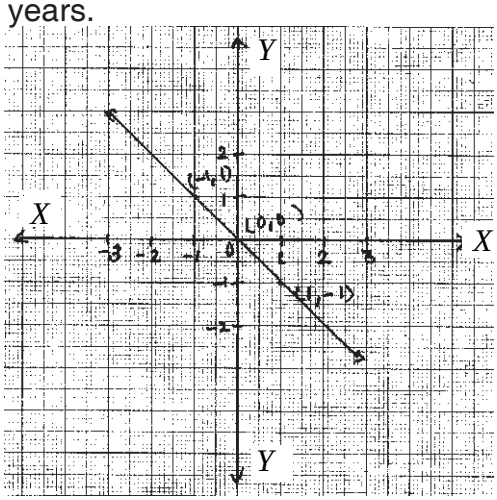
29. A number is $\frac{2}{3}$ of the other number.

30. The sum of the ages of a brother and a sister is 50 years.

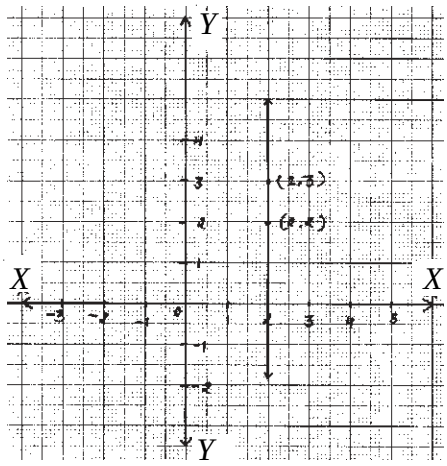
31. Rupali is 7 times as old as Jayana.

32. Two times of a number when added to another number gives 15.

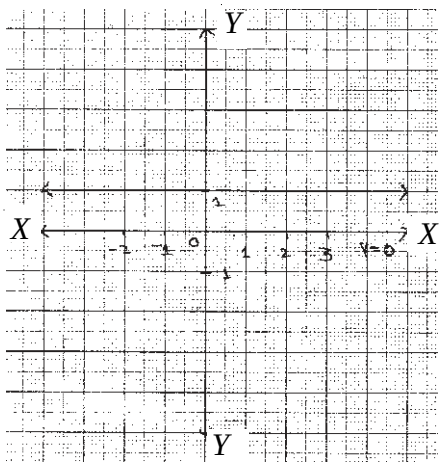
33. Choose the correct equation from the choices given for the following graph:
(i) y = x
(ii) x + y = 0
(iii) y = 2x
(iv) 2 + 3y = 7x



34. Observe the graph and give the corresponding equations for it.



35. Observe the graph and give the corresponding equations



36. To which axis the graph of the equation 3x - 2 = 0 is parallel.

37. To which axis the graph of the equation y = -5 is a line parallel.

38. At which point the graph of the equation x = -3 intersects x-axis?.

39. At which point the graph of the equation x + y = 0 intersect x-axis and y-axis?

40. Which axis does y = 0 represents?

41. In the graph y = 2 what will be the ordinate for any value of abscissa.

42. In the graph x = -1 what will be the ordinate for any value of abscissa.

43. To which axis the graph of x = -1 will be parallel to?

44. How many solutions a linear equation in two variables have?

45. The auto fare in Delhi is as follows: For the first kilometer, the fare of Rs. 10 and for each subsequent distance it is Rs. 5 per km. If the distance covered is x km and the total fare is Rs. y. Represnt this information as a Linear Equation.

46. A pen costs Rs. 10 and a pencil costs Rs. 2. Form an equation that represents the total money spent on buying different combinations of pen and pencils, if the total money spent is Rs. 110.

47. Verify that which among the following is not a solution of equation 2x - y = 4

(i) x = 0, y = -4 (ii) x= 3, y = 2 (iii) x = 1, y = 1 (iv) y=0, x = 2

48. Represent 3x + 5y -11 =0 as y in the form of x. Find the point where the equation intersects y-axis.

CHAPTER 4
Answer
(Linear Equation in Two Variable)

1. An equation is a statement of equality involving one or more unknown quant ities called variable.
2. An equation is called a linear equa tion in one variable, if only a single variable with degree one occurs in the equation.
3. Only one solution
4. A linear equation in the form of ax + by + c = 0 wher a, b, c are real num bers, $a \neq 0, b \neq 0$, and x and y are two variables.
5. Infinite solutions.
6. $y = \frac{-c - ax}{b}$
7. $y = \frac{x-4}{2}$
8. $x = \frac{9-5y}{2}$
9. $x = \frac{9-y}{\pi}$
10. $a = 3, b = -\sqrt{2}, c = -8$
11. a = 2, b = 6, c = 0
12. 5x - y -50 =0, a = 5, b = -1, c =-50
13. x - 0y + 9 = 0
14. 0x+3y - 7 = 0
15. 0x + 5y -2 = 0
16. No
17. No
18. No
19. Yes
20. No
21. (2, 0) (0, 6)
22. on x-axis (-3, 0) , on y -axis (0, 9)
23. Yes
24. x-axis (3, 0) , y-axis - (0, -2)
25. (i) (4, 1) $\left(\frac{1}{2}, \frac{12}{5}\right)$

    (ii) (-2, -2) (1, -5)

    (iii) (1,1) (2,2)
26. p = 3
27. p = 12
28. $p = \frac{3a-5}{2}$
29. $x = \frac{2}{3}y$
30. x + y = 50
31. x = 7y
32. 2x + y = 15
33. (ii) x + y = 0
34. x = 2
35. y = 1
36. y-axis
37. x-axis
38. (-3, 0)
39. (0, 0)
40. x- axis

41. y = 2

42. y-axis

43. y-axis

44. Infinite solution

45. $y = 5(x - 1) + 10 \Rightarrow y = 5x + 5$

46. 10x + 2y = 110 , where x = no. of pens bought y = no. of pencils boughts.

47. III is not the solution.

48. $y \quad \frac{11-3x}{5}$, point is $\left(0, \frac{11}{5}\right)$

CHAPTER-5

Introduction to Euclid's Geometry

1. Which are the two greek words, the word 'geomentry' has been derived from?
2. What is the meaning of these two words?
3. What does the word 'geometry' mean?
4. Who were the first people to study geometry?
5. Who were the people who used the knowledge of geomentry for calculating areas of fields and volume of grain storehouses.
6. Who developed formulae for areas of rectilinear figures such as rectangles and traiangles.
7. To whom goes the credit for the systematic study of geometry.
8. Name the two most well known greek Mathematicians?
9. Who is known as the 'father of geometry'?
10. What is the name of Euclid's most famous work?
11. Name two Indian mathematicians who contributed significantly in the field of geometry?
12. What is the difference between axioms and postulates?
13. State Euclid's postulate for a straight line.
14. State Euclid's postulate for a straight circle.
15. What is Euclid's postulate on right angles?
16. What is Euclid's fifth postulate ?
17. Who restated the fifth postulate of Euclid's?
18. What is the name given to restated form of Euclid's fifth postulate?
19. Give the statement of restated form of Euclid's fifth postulate?
20. What is the difference between axioms and Theorems?
21. What is the historical importance of Euclid's fifth postulate?
22. What is the least number of distinct points which determine a unique line?
23. In how many maximum numbers of points can two distinct lines intersect?
24. State playfair's Axiom.

25. What is the name of the work that contained Euclid's thirteen volumes?

26. How many lines can be drawn through a single point?

27. Can two distinct intersecting lines be parallel to the same line? Why?

28. Given two points L and M, how many line segments do they determine?

29. Name the line segments determined by three collinear points x, y and z?

30. What are the three basic concepts in geometry?

Fill in the blanks: Q. No. 31 to Q. No. 37.

31. Things which are equal to the same things are _____ to one another.

32. The _____ is greater than the part.

33. Things which are double of the _____ are equal to one another.

34. Two distinct point in a plane determine a _____ line.

35. A line seperates a plane into _____ parts namely the _____ and the _____ itself.

36. Two distinct _____ in a plane cannot have more than one point in common.

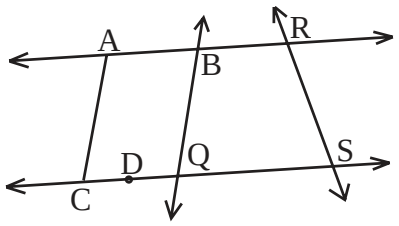
37. Given line and a point, not on the line, there is one and only one _____ line which passes through the given point and is _____ to the line.

38. If B lies between A and C, AC = 15 cm, BC = 9 cm, what is $(AB)^2$

39. Does a line have any length.

40. Give an example of geometrical straight line.

41. In fig 1 name the following



(i) 3 line segments

(ii) 4 collinear points

(iii) a pair of non-intersecting line segments.

42. What is the difference between intersecting lines and concurrent lines?

43. State parallel Axiom.

44. If line AB, AC, AD, AR are parallel to a line l, then points A, B, C, D and R are _____.

45. What do you understand ‘betweenness’?

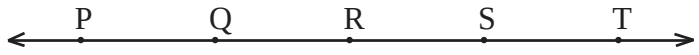
46. Explain mid point of a line segment with the help of an example.

47. Explain congruence of line segments.

48. Give the definition of the point as given by Euclid.

49. Give the definition of a ‘line’ as given by Euclid.

50. With reference to the fig 2 given below, state which statement is true and which is false.



(i) PQ + QR = PR

(ii) PR + PS = PS

(iii) Lines PQ and PS are coincident.

(iv) Points R, S, T lie on the line PQ.

CHAPTER 5
Answer
(Introduction to Euclid's Geometry)

1. 'geo' and 'metrien'
2. 'Geo' means 'the earth' 'metrien' meand 'measure'
3. 'measurement of the earth'
4. The enciant Egypticians and the babylonians.
5. The Egypticians
6. The Babylonians
7. The Greeks
8. Thales and Pythagoras
9. Euclid
10. Elements
11. Brahamgupt, Bhaskar II, Aryabhatt
12. Axioms are the common nations (as sumptions) used throughout mathematics and not specially linket to gerometry.

    Postupates are the assumptions specific to geometry.
13. A strainght line may be drawn from any Egypticians one point to any other point
14. A circle can be drawn with any radius and any centre.
15. All right angles are equal to one another.
16. If a staright line falling on two straight lines make the interior angles on the same side of it taken together less then two right angles, if produced indefinitely, meet on that side on which the sum of angles is less than two right angles.
17. John Playfair in 1729.
18. Playfair's Axiom
19. Two distinct intersecting lines cannot be parallel to the same line.
20. Axioms are the basic facts which are taken for granted without proof. They are obvious universal truth.

    Theorems are statement which are proved through logical reasoning based on previously proved results and some Axioms.
21. Inspite of several attempts till today, this postulate could not be proved as a theo rem . Moreover, these attempts have led to the creation of different other geometries

known as non-euclidean geometries.

22. Two

23. One

24. Two distinct intersecting lines cannot be parallel to the same line.

25. Elements

26. Infinite

27. No, Playfair's Axiom

28. One

29. XY, YZ, ZX

30. Point, line and plane

31. Equal

32. Whole

33. Same thing

34. Unique

35. Three, two half planes, line

36. lines

37. perpendicular, perpendicular

38. 36

39. Yes (Breadthless)

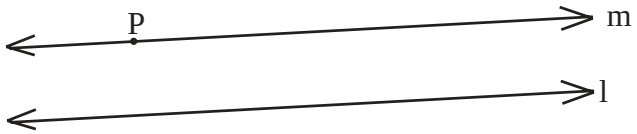
40. The edge of the ruler

41. (i) AC, BQ, RS (ii) C,D, Q, S (iii) AC, BQ

42. When two lines have a common point they are called intersecting lines.

When more then two lines have a common point, they are called concurrent lines.

43. If l is a line and P is point not on line l, there is one and only one line which passes, thnrough p and is parallel to l.



44. Collinear

45. A point C is said to lie between two points A & B if A, B and C are collinear points and AC + CB = AB

46. A point M is said to be the mid point of AB if M is an interior point of AB and AM = MB

47. If two line segments have equal lengths, they are congruent to one another.

48. A point is that which has no part.

49. A line is breadthless length.

50. (i) True (ii) False (iii) True (iv) True

CHAPTER-6

Lines and Angles

◆ If a ray stands on a line, then the sum of the two adjacent angles so formed is 180° and vice versa. This property is called as the Linear pair axiom.

◆ In fig. 1

$$x \quad 90 \quad \frac{1}{2}y$$

or $\quad BOC \quad 90 \quad \frac{1}{2} \quad BAC$

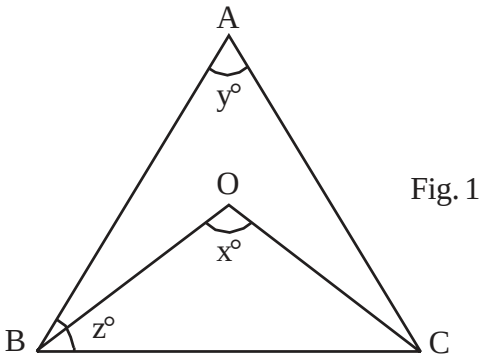


Fig. 1

In fig. 2

$$BOC \quad 90 \quad -\frac{1}{2} \quad x$$

or $\quad BOC \quad 90 \quad -\frac{1}{2} \quad BAC$

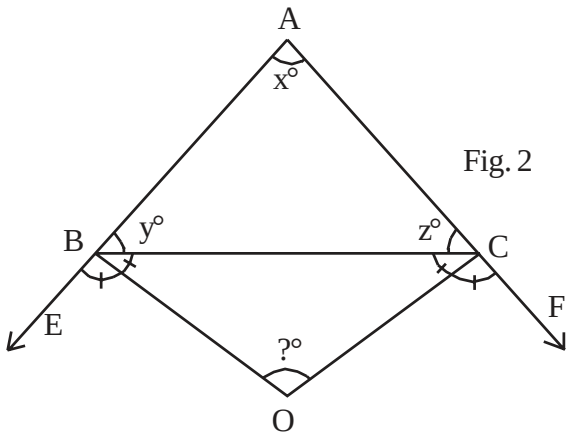


Fig. 2

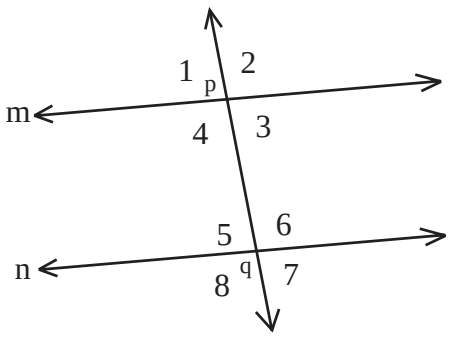
◆ If two lines intersect each other, then the vertically opposite angles are equal.

◆ If a transversal intersects two parallel lines :–

(i) Each pair of corrosponding angles are equal.

(ii) Each pair of alternate interior angles is equal.

(iii) Each pair of interior angles on the same side of the transversal is supplementary.



◆ If a transversal intersects two or more lines :–

(a) Corrosponding angles

(i) 1 5

(ii) 2 6

(iii) 4 8

(iv) 3 7

(b) Alternate exterior angles

(i) 1 7

(ii) 2 8

(c) Alternate interior angles

(i) 4 6

(ii) 3 5

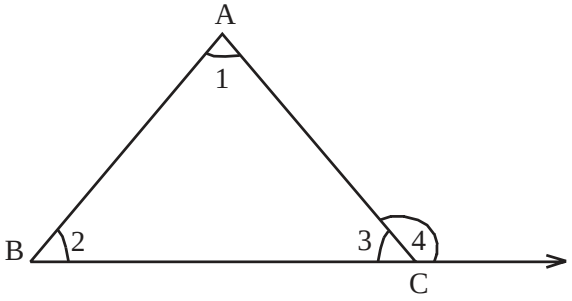
(d) Interior angles on the same side of a transversal

(i) 4 5 180

(ii) 3 6 180

◆ Lines which are parallel to a given line are parallel to each other.

◆ The sum of the three angles of a triangle is 180°.



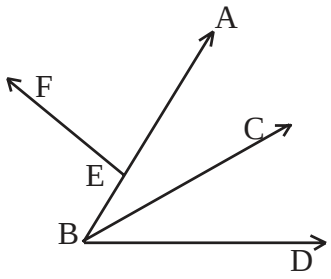
4 1 2

Exterior angle property

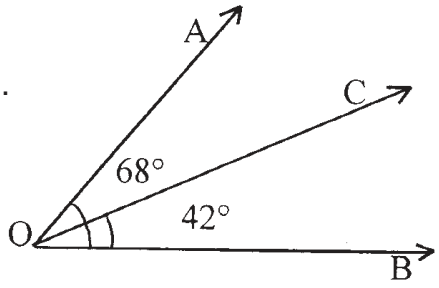
CHAPTER-6

Lines and Angles

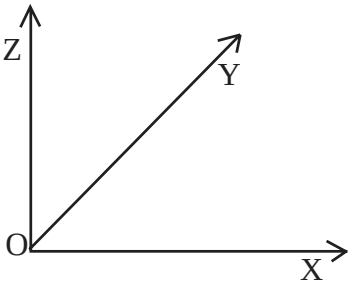
1. Name two pair of adjacent angles given in the adjoining figure.



2. In the figure find $\angle AOC$ if $\angle AOB = 68^0$ and $\angle BOC = 42^0$.



3. If $\angle XOY$ and $\angle YOZ$ are two adjacent angles, find the measure of $\angle XOZ$ if $\angle XOY = 56^0$ and $\angle YOZ = 34°$.

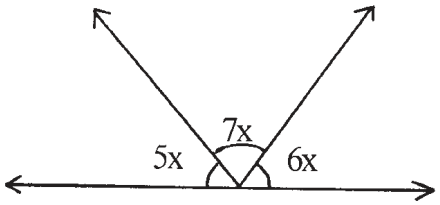


4. If the angle is equivalent to its complement what is the measure of that angle?

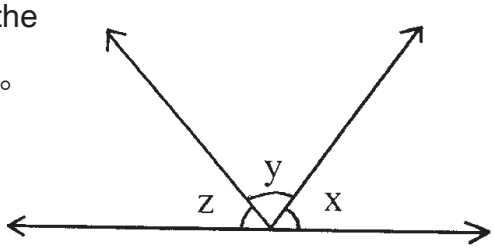
5. What is the measure of the angle if its supplementary angle measure 98^0.

6. Angles of a linear pair are in the ratio 8:1. What is the degree measure of both angles.

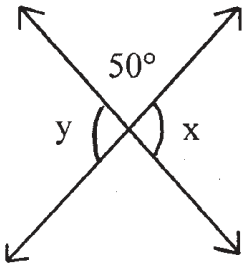
7. Find the value of x from the adjoining figure.



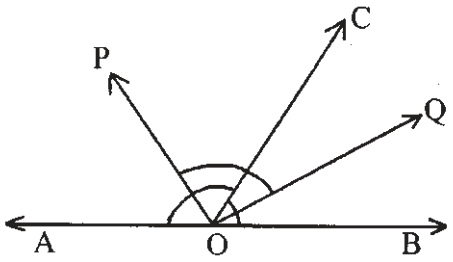
8. If three angles x, y andz are angles as shown in the figure. Find the value of $\frac{1}{2}$z if x = 58^0 and y = 42°



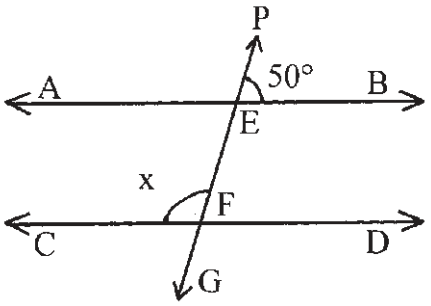
9. In the fig., find the value of x + y



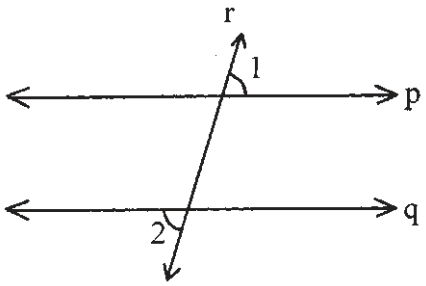
10. In the fig. if OP is the bisector of $\angle AOC$ and OQ is the bisector of $\angle BOC$ then find $\angle POQ$.



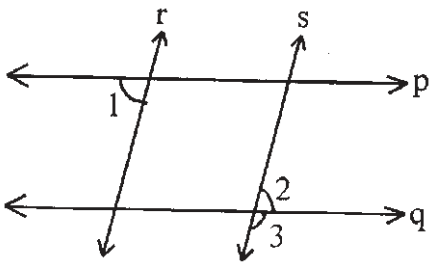
11. In fig. $\angle PEB = 50^0$ and AB||CD , then find x.



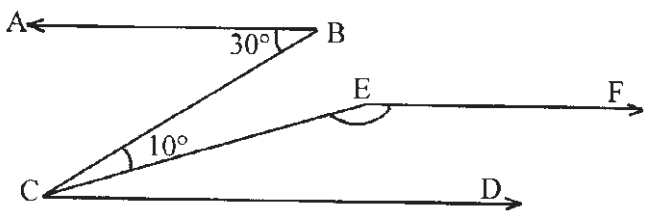
12. In fig. p||q, $\angle 1 = 70^0$ then find $\angle 2$.



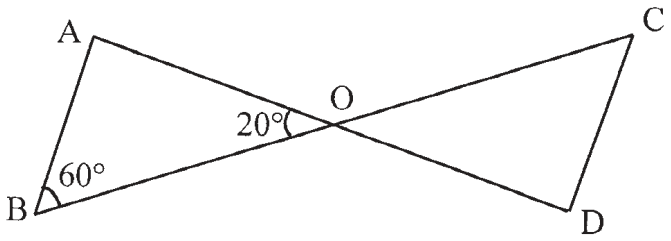
13. In fig. p||q & r||s $\angle 1 = 80^0$ then find $\angle 3$.



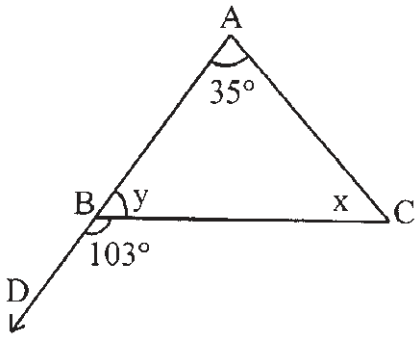
14. In fig. AB||CD and CD||EF , if $\angle ABC = 30^0$, $\angle BCE = 10^0$ then find $\angle CEF$.



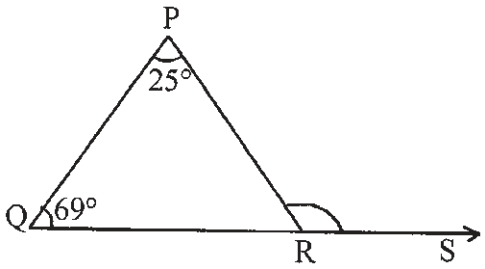
15. In fig. AB||CD, $\angle ABO = 60^0, \angle AOB = 20^0$ then find $\angle ODC$.



16. In fig. $\angle CBD = 103^0$ & $\angle BAC = 35^0$ find x and y.



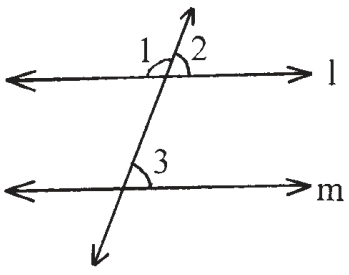
17. In fig. $\angle PQR = 69^0$, $\angle QPR = 25^0$ find $\angle PRS$.



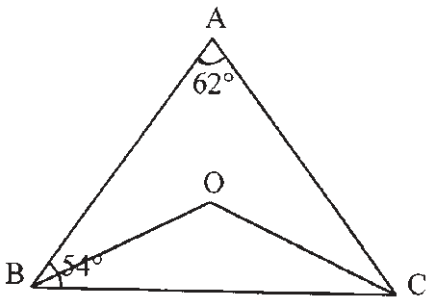
18. The angles of the triangle are in the ratio 2:3:4. Find the angles of the triangle.

19. The angles of the triangle are in the ratio 1:3:6. Find the angles of the triangle.

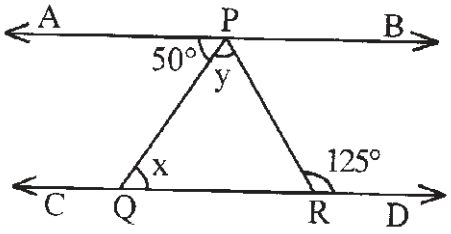
20. In fig. $l \parallel m$ $\angle 1 : \angle 2 = 3 : 2$ find $\angle 3$.



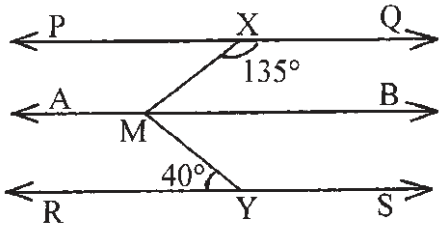
21. In fig. OB and OC are bisectors of $\angle B$ and $\angle C$ of ΔABC respectively. If $\angle BAC = 62^0$, $\angle ABC = 54^0$, then find $\angle BOC$



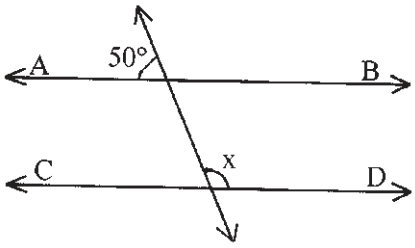
22. in fig., if AB||CD, $\angle APQ = 50^0$ and $\angle PRD = 125^0$, find x and y.



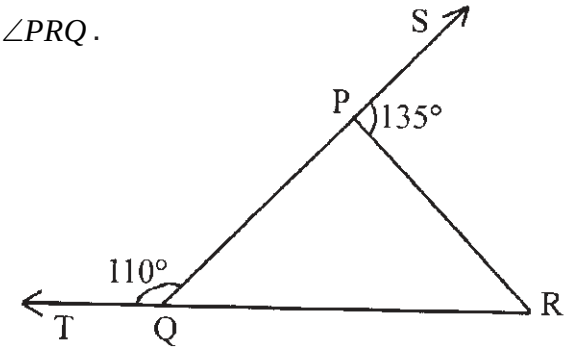
23. Iin fig., PQ||RS||AB $\angle MXQ = 135^0$ and $\angle MYR = 40^0$, find $\angle XMY$.



24. In fig. AB ||CD. Then find x.



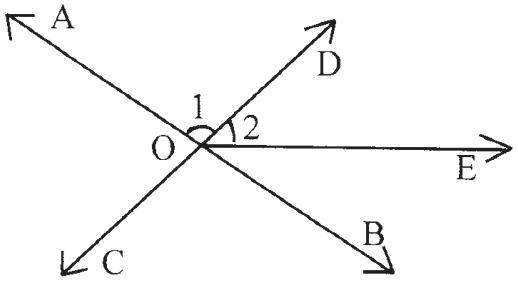
25. In fig. $\angle SPR = 135^0$ and $\angle PQT = 110^0$ then find $\angle PRQ$.



26. The complementary angle of any given angle is 2^0 more than the thrice of that angle. What is the measure of angles.

27. The angle and its supplementary angle are in the ratio 2:3. What is the measure of each angle.

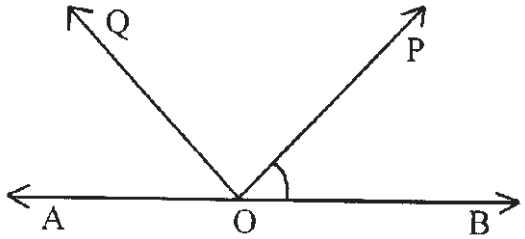
28. In fig. AB and CD are straight lines which intersects at the point O. If $\angle 1 = 70^0$ and OE bisects $\angle BOD$ then find $\angle 2$.



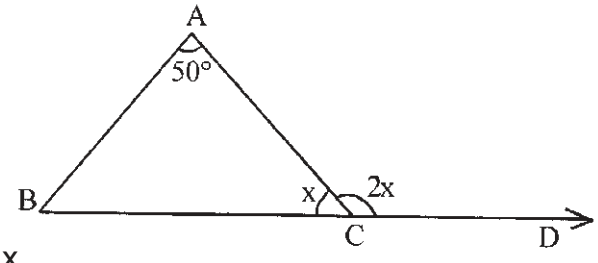
29. If complementary angle of an angle is twice the angle. Then find the angle.

30. If complementary angle of an angle is 2^0 more than the angle. Then find the angle.

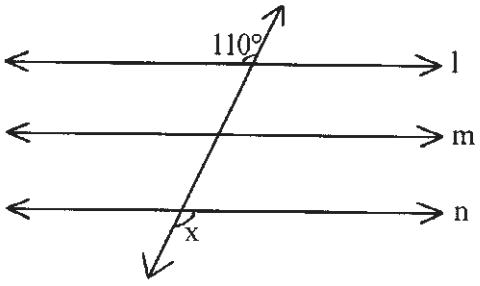
31. In fig. $\angle BOP = 40°$, OQ bisects $\angle AOP$. Find $\angle AOQ$.



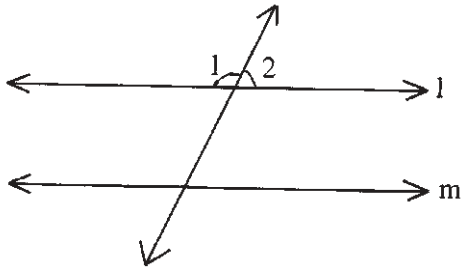
32. In fig. $\angle ACD$ is twice of $\angle ACB$, if $\angle BAC = 50^0$, then find $\angle ABC$.



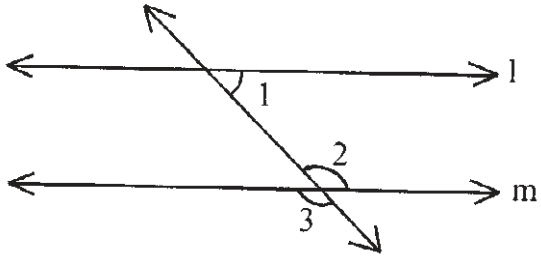
33. If l||m amd m||n then find x.



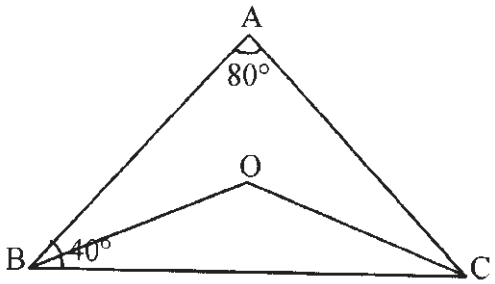
34. l||m, if $\angle 1 : \angle 2 = 7 : 3$ then find $\angle 1$ and $\angle 2$.



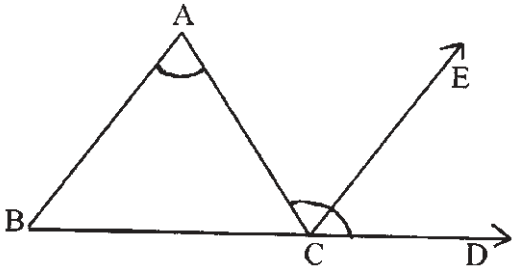
35. In fig. l||m, if $\angle 1 : \angle 2 = 2 : 3$ then find $\angle 3$.



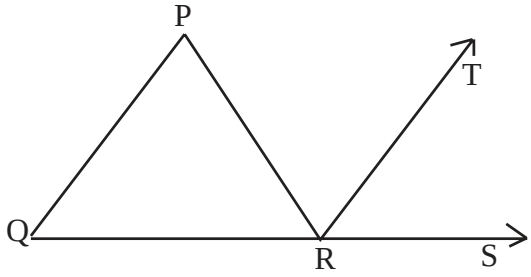
36. In fig. $\angle BAC = 80^0$ and $\angle ABC = 40^0$ BO and CO are the bisectors of $\angle ABC$ and $\angle ACB$ respectively. Then find $\angle BOC$.



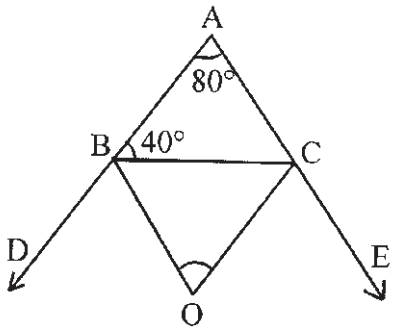
37. If CE is the bisector of $\angle ACD$ and CE||BA and $\angle ACD = 130^0$. Then find $\angle BAC$.



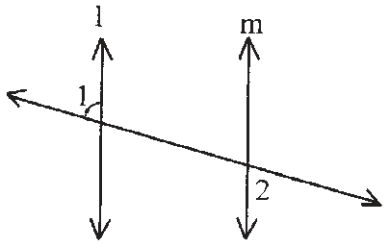
38. If RT is the bisector of $\angle PRS$ and PQ||RT and $\angle PRS = 110^0$. Then find $\angle PQR$.



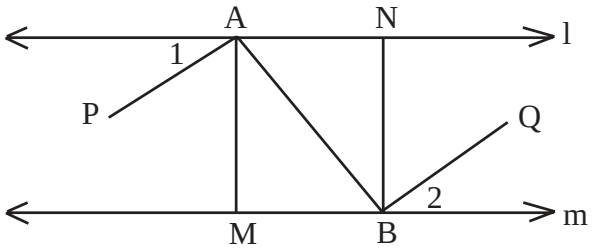
39. In fig. BO and CO are bisectors of external angle at B and C respectively. If $\angle BAC = 80°$ and $\angle ABC = 40°$. Then find $\angle BOC$.



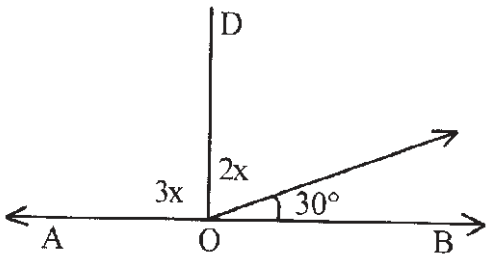
40. In fig. l||m. If $\angle 1 = 45°$, then find $\angle 2$.



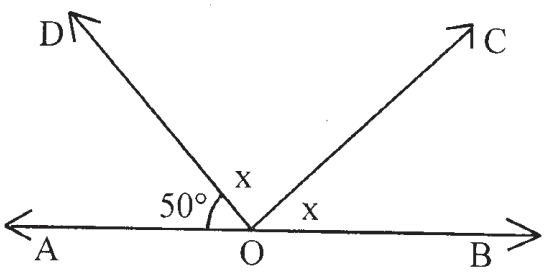
41. In fig. l||m, AM and BN are prependicular to l and m respectively. If AM bisects $\angle PAB$ and BN bisects $\angle ABQ$ and $\angle 1 = 30°$, then find $\angle 2$.



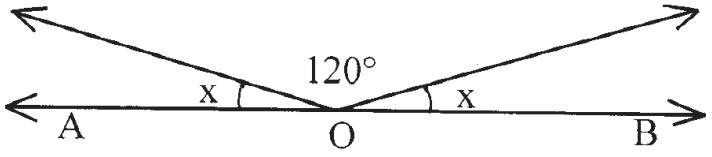
42. Find the value of x.



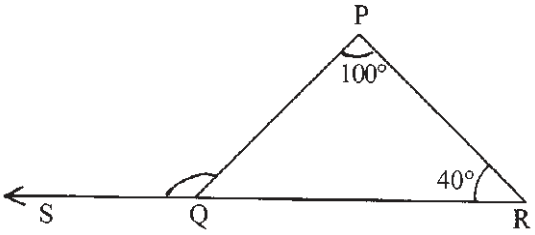
43. Find the value of x.



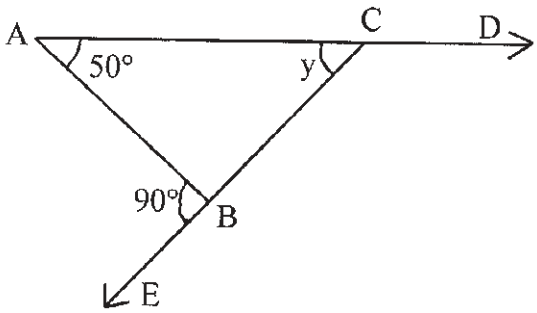
44. In the fig. find the value of x.



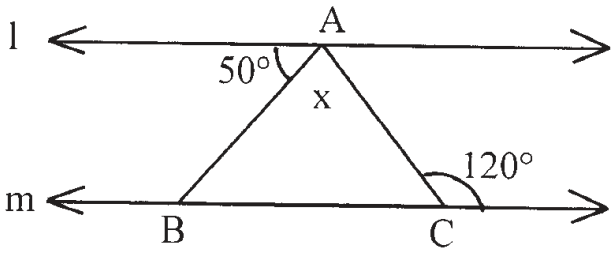
45. In fig. if $\angle P = 100°$ and $\angle R = 40°$, then find $\angle PQS$.



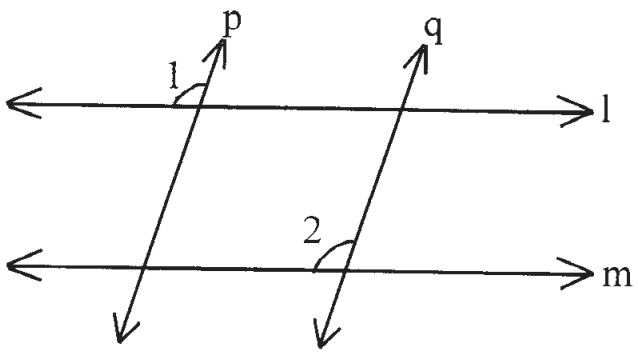
46. In fig. if $\angle BAC = 50°$, $\angle ABE = 90°$, then find the value of y.



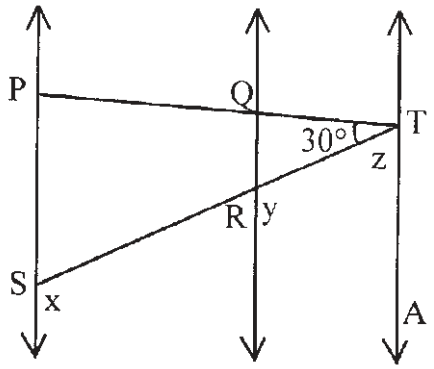
47. In fig. l||m, then find the value of x.



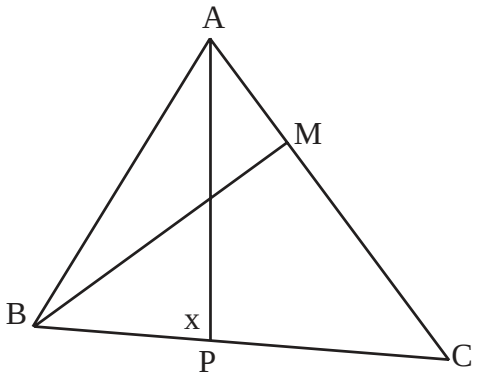
48. In fig. l||m and p||q, $\angle 1 = 100°$, Then find value of $\angle 2$



49. In the fig. PS||QR||TA, $PT \perp TA$, $\angle QTR = 30°$, find the value of x, y, z.



50. In the fig. $BM \perp AC$, $\angle MBC = 35°$, $\angle PAC = 40°$, find the value of x.



CHAPTER 6
Answer
(Lines and Angles)

1. $\angle ABC$ and $\angle DBC$; $\angle BEF$ and $\angle AEF$
2. $\angle AOC = 26^0$
3. $\angle XOZ = 90^0$
4. Each angles is equal to 45^0
5. 82^0
6. 160^0 and 20^0
7. x = 10^0
8. $\frac{1}{2}z = 40^0$
9. x + y = 260^0
10. $\angle POQ = 90^0$
11. x = 130^0
12. $\angle 2 = 70^0$
13. $\angle 3 = 100^0$
14. $\angle CEF = 160^0$
15. $\angle ODC = 100^0$
16. x = 68^0 , y = 77^0
17. $\angle PRS = 94^0$
18. $40^0, 60^0, 80^0$
19. $18^0, 54^0, 108^0$
20. $\angle 3 = 72^0$
21. $\angle BOC = 121^0$
22. x=50^0 , y = 75^0
23.. $\angle XMY = 85^0$
24. $x = 130^0$
25. $\angle PRQ = 65^0$
26. 22^0 , 68
27. $72^0, 108^0$
28. $\angle 2 = 55^0$
29. 30^0
30. 44^0
31. $\angle AOQ = 70°$
32. $\angle ABC = 70^0$
33. $x = 110^0$
34. $\angle 1 = 126^0$, $\angle 2 = 54^0$
35. $\angle 3 = 108^0$
36. $\angle BOC = 130^0$
37. $\angle BAC = 65^0$
38. $\angle PQR = 55^0$
39. $\angle BOC = 50^0$
40. $\angle 2 = 45^0$
41. $\angle 2 = 30^0$
42. $x = 30^0$
43. $x = 65^0$
44. x 30^0
45. $\angle PQS = 140^0$
46. $y = 40^0$
47. $x = 70^0$
48. $\angle 2 = 100^0$
49. $\angle x = 120^0, \angle y = 120^0, \angle z = 60^0$
50. 95^0

(Chapter-7)

Triangles

- Two figures are congurent, if they are of the same shape and the same size.
- If two triangles ABC and PQR are congruent under the correspondence $A \quad R$, $B \quad C$ and $C \quad R$, then symbolically it is expressed as $ABC \quad PQR$
- Two circles of the same radii are congruent.
- If two sides and the included angle of one triangle are equal to two sides and the included angle of the other triangle, then the two triangles are congruent (SAS congruence rule)
- If two angles and the included side of one triangle are equal to two angles and the included sides of the other triangle, then the two triangles are congruent by (ASA Congruence Rule)
- If two angles and one side of one triangle are equal to two angles and the corresponding side of the other triangle, then the two triangles are congruent by (AAS Congruence Rule)
- Angle opposite to equal sides of a triangle are equal.
- Sides opposite to equal angles of a triangle are equal.
- Each angle of equilateral triangle is 60°.
- If all the sides of one triangle equals to all sides of the other triangle, then the triangles are congruent (SSS Congruence Rule)

- If the two right triangles, hypotenuse and one side of one triangle are equal to the hypot enuse and one side of the other triangle, then the two triangles are congruent (RHS Congruence Rule)

- In a triangle, angle opposite to the longer side is larger.

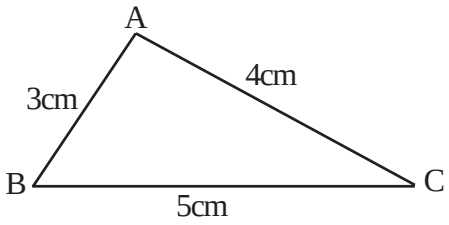
- In a triangle, size opposite to the larger (greater) angle is longer.

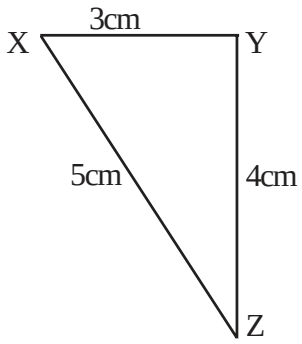
- Sum of any two sides of a triangle is greater than the third side.

(Chapter-7)

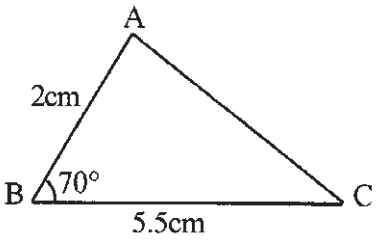
Triangles

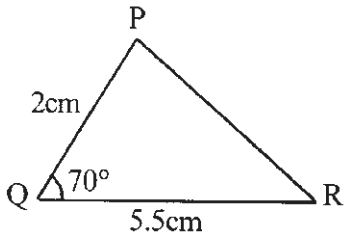
1. Two triangles given in the figure are congruent. Give the correspondence between the triangles?



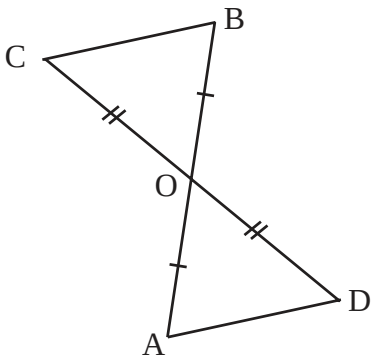


2. Which criterion (or congruence rule) is used for the congruency of two triangles?

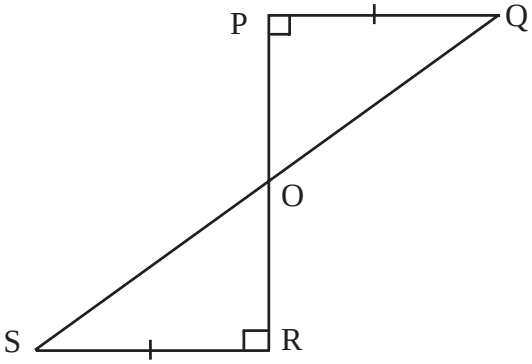




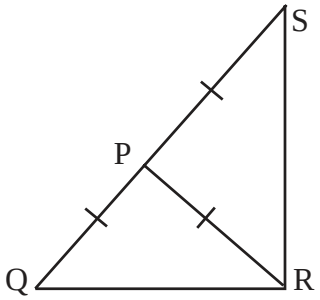
3. In the figure which two triangles are congruent?



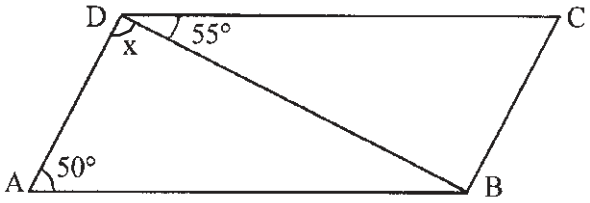
4. In the figure which congruency rule is used to prove that SQ bisects PR.



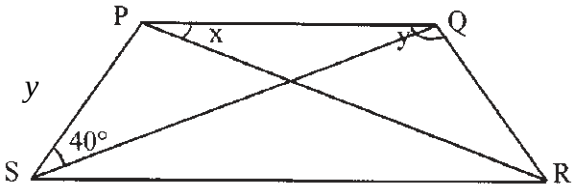
5. In the figure PQ = PR = PS. Find $\angle QRS$



6. In the figure find x if BC = AD and AB = CD.



7. In the figure $PQ \| SR$ and PS = QR. Find $2x$ y

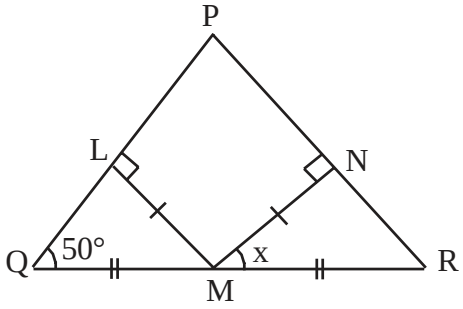


8. In the figure

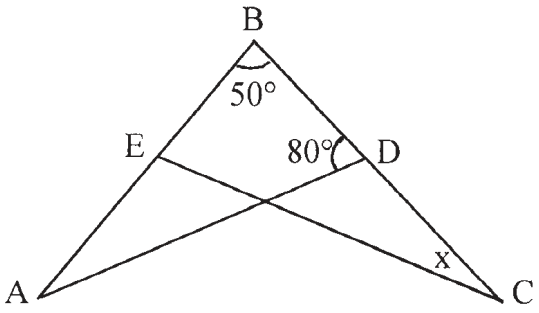
$LM \quad MN, \quad QM \quad MR$

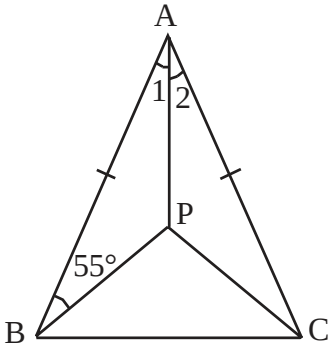
$LM \quad PQ, \quad MN \quad PR$

$\angle Q = 50^\circ$. Find x



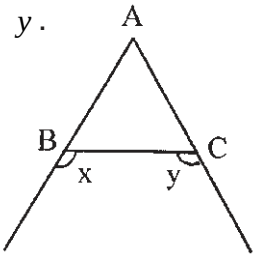
9. In the figure AB = BC, and $\angle A = \angle C$. Find x.



10. 

In $\triangle ABC$, AB = AC and $\angle 1 = \angle 2$, $A \quad 40^\circ$. Find $\angle PBC$ and $\angle PCB$.

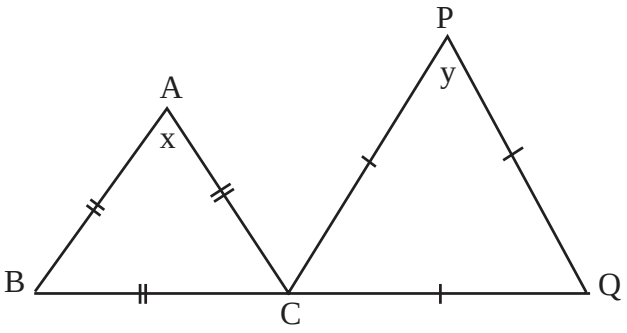
11. In the figure ABC is an equilateral triangle. Find x y.



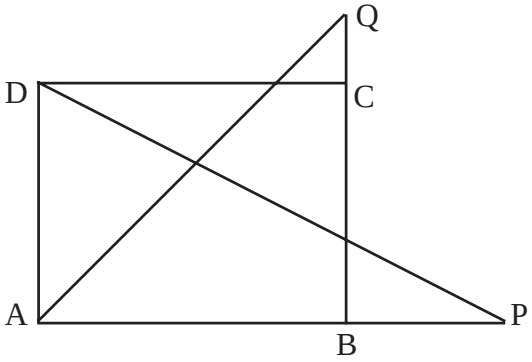
12. In a right angled triangle one acute angle is double the other. Find both the angles.

13. In a triangle, sum of two sides of a triangle is always _____ than the third side.

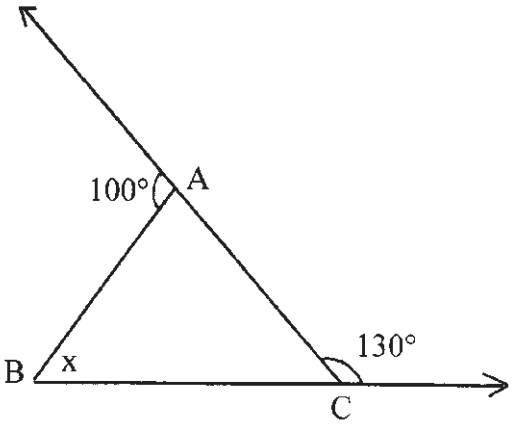
14. In a figure find x y.



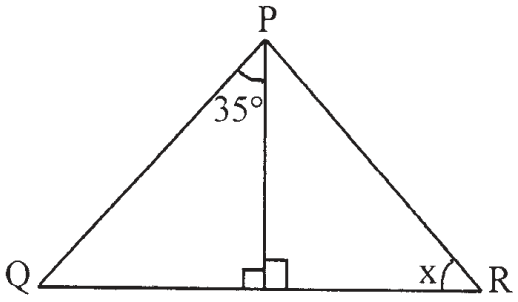
15. In the figure ABCD is a square. Sides AB and BC are produced to points P and Q such that BP = CQ. If DP = 7 cms. Find AQ.



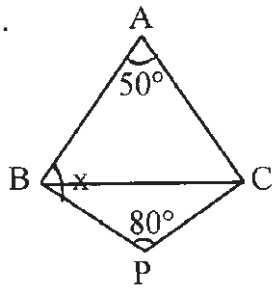
16. In the figure find x.



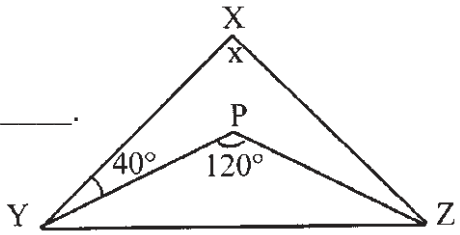
17. In the figure, PQ = PR. Find x.



18. In the figure ABC and PBC are two isosceles triangles. Find x.

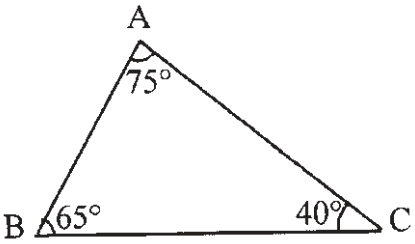


19. XYZ and PYZ are two isosceles triangles on the same base YZ. If $\angle P = 120^\circ$ and XYP 40°. Find x.

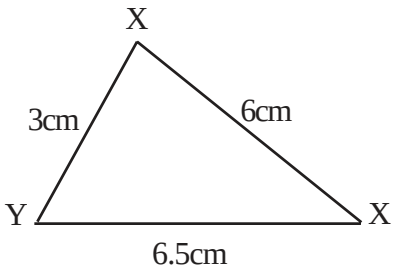


20. In a triangle angle opposite to longer side is _____.

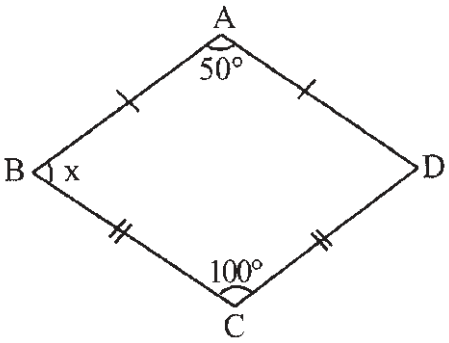
21. In the figure which is the longest side?



22. Which angle of XYZ is greatest?



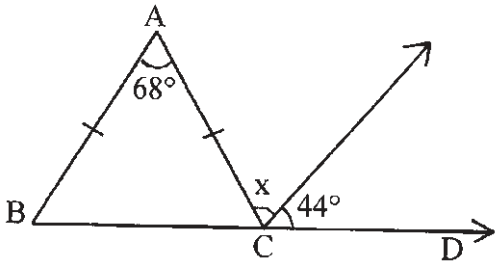
23. In quadrilateral ABCD, AB = AD and BC = CD. Find x.



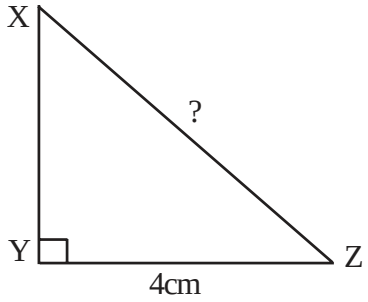
24. Angles opposite to equal sides of a triangle are _____.

25. In a right angled triangle hypotenuse is the _____ side.

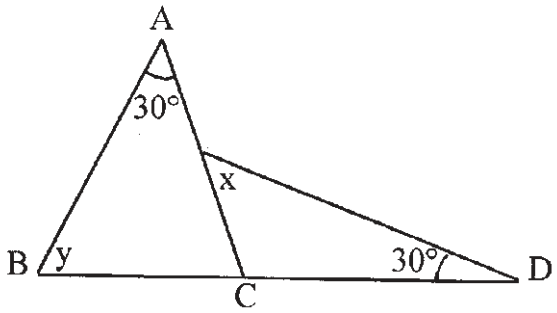
26. In the figure find x.



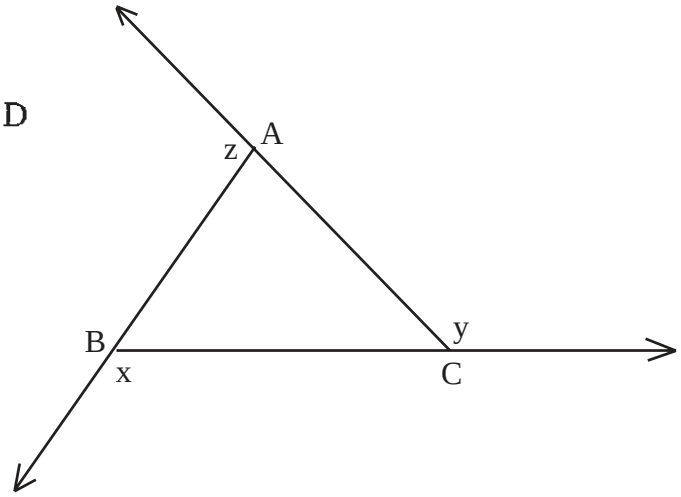
27. In the given figure XYZ is a right angled triangle. If XY=8cm and YZ = 4 cm. Find XZ.



28. In the figure $\angle A = \angle D = 30^\circ$. Find $x + y$.

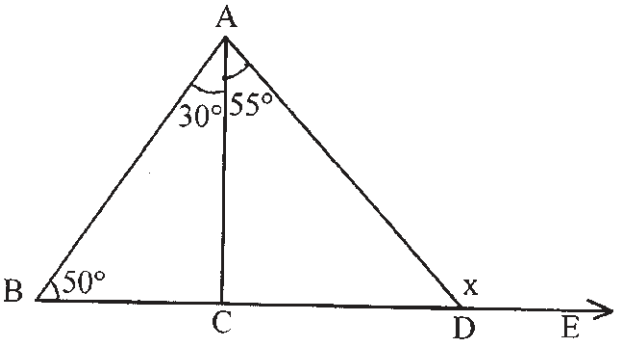


29. In the figure find x y z.

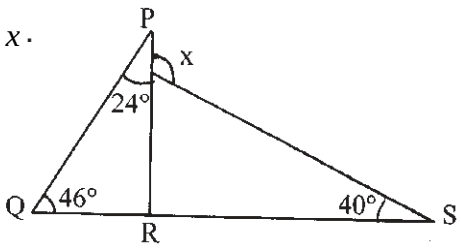


30. In a triangle ABC, sides AB = 5 cms. BC = 3 cms and AC = 5.5 cms. Which angle is the largest angle?

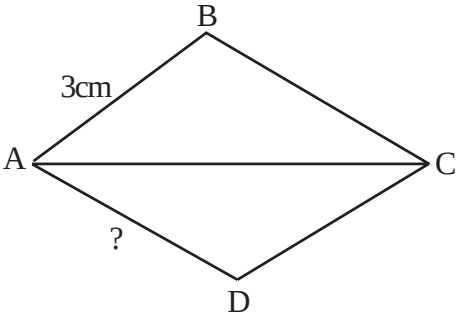
31. From the given figure find x.



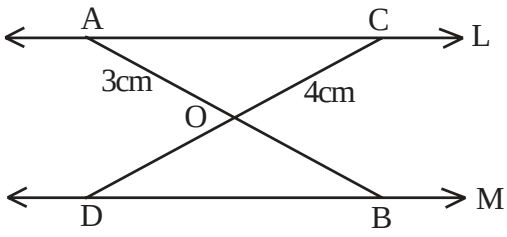
32. In the figure $\angle P = 24^\circ$, $\angle Q = 46^\circ$ and $\angle S = 40^\circ$. Find x.



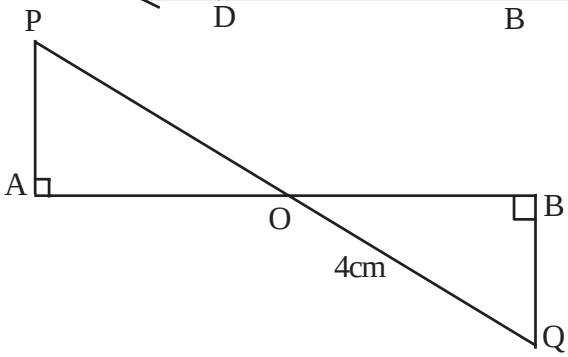
33. In the figure AC bisects angles $\angle A$ and $\angle C$. If AB = 3 cm. Find AD.



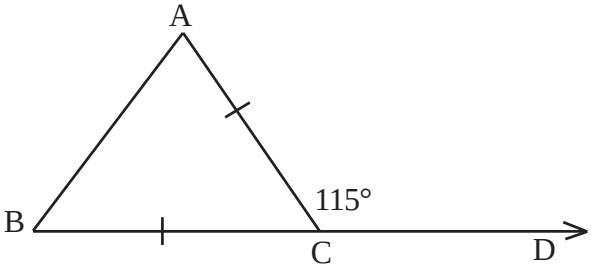
34. In the figure $l \parallel m$, AC = DB. Find CD and AB.



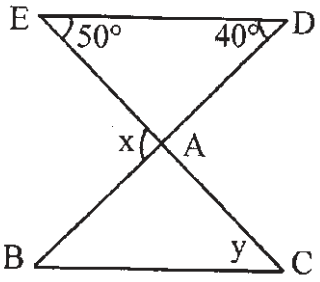
35. Find PQ from the figure. If PA = QB.



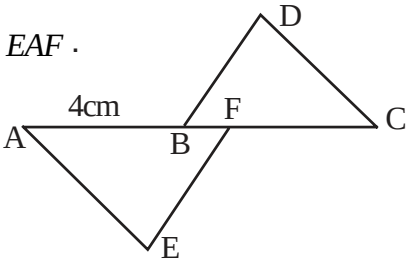
36. Find $\angle BAC$ if AC = BC.



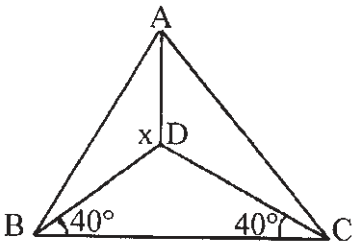
37. In the figure $DE \parallel BC$. Find x y.



38. In the adjoining figure DBC EAF.
If AB = 4 cm. Find FC = ?



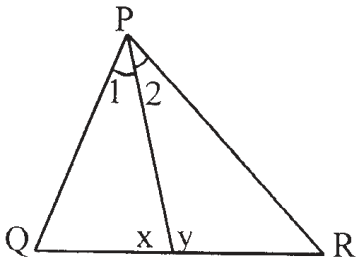
39. In ABC, AB = AC. $\angle DBC = \angle DCB = 40^\circ$. Find x.



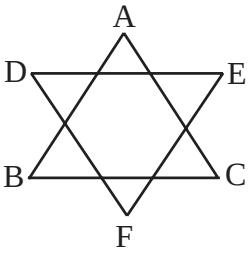
40. In a triangle sum of three altitudes is _____ than the perimeter of the triangle.

41. In a triangle perimeter is _____ than the sum of three medians.

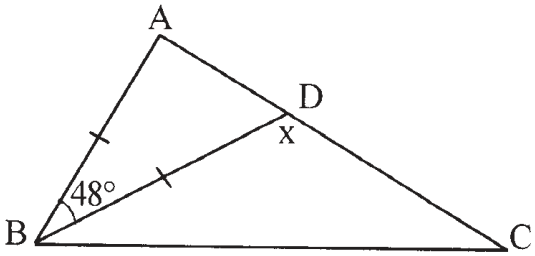
42. In the figure PQR is an isosceles triangle, PQ = PR. If $\angle 1 > \angle 2$, what is the relation between x and y.



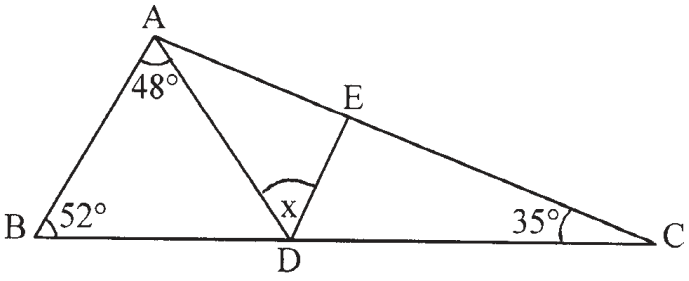
43. In the figure ΔABC and ΔDEF are equilateral triangles. Give the measure of $\angle A$, $\angle D$, $\angle F$.



44. In the figure BA = BD. If $\angle ABD = 48^\circ$ find x.



45. From the figure find x.



Triangles (Chapter-7)
Answers

1. $AB = XY = 3cm$
   $BC = XZ = 5cm$
   $CA = ZY = 4cm$

2. Side-Angle-Side (SAS) Criterion

3. $BOC \quad AOD$

4. AAS criterion or ASA criterion

5. $\angle QRS = 90^\circ$

6. $x \quad 75^\circ$

7. $2x \quad y \quad 180^\circ$

8. $x \quad 40^\circ$

9. $x \quad 50^\circ$

10. $\angle PBC = 15^\circ$
    $\angle PCB = 15^\circ$

11. 240°

12. $30^\circ, \ 60^\circ$

13. Greater

14. $x \quad y \quad 120^\circ$

15. AQ = 7cm

16. $x \quad 50^\circ$

17. $x \quad 55^\circ$

18. $x \quad 115^\circ$

19. $x \quad 40^\circ$

20. Greater

21. BC

22. X

23. $x \quad 105^\circ$

24. Equal

25. Longest

26. $x = 80^\circ$

27. $XZ = 4\sqrt{5}cm$

28. $x \quad y \quad 120^\circ$

29. 360°

30. $\angle B$

31. $x \quad 135^\circ$

32. $x \quad 110^\circ$

33. AD = 3cm

34. $AB \quad 6cm$
    $CD \quad 8cm$

35. PQ = 8cm

36. $\angle A = 57.5^\circ$

37. $x \quad y \quad 140^\circ$

38. FC = 4cm

39. $x = 130^\circ$

40. Less

41. Less

42. $y \quad x$

43. $\angle A = 60^\circ, \ \angle D = 60^\circ,$
    $\angle F = 60^\circ$

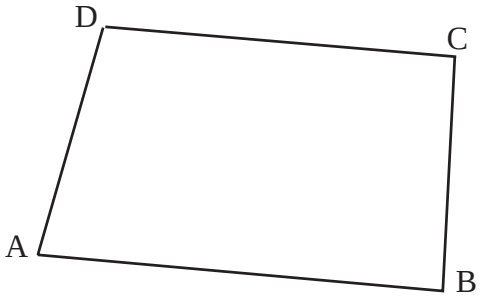
44. x = 114°

45. x = 45°

(Chapter-8)

QUADRILATERALS

- A quadrilateral has four sides, four angles and four vertices.

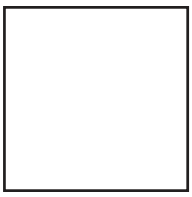


- The sum of angles of a quadrilateral is 360°.

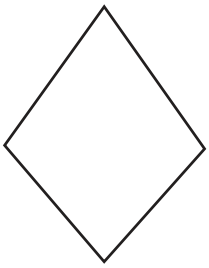
- In a parallelogram (IIgm) :–
  (i) Opposite sides are equal.
  (ii) Opposite angles are equal.
  (iii) Diagonal bisects each other

- A quadrilateral is a parallelogram if :–
  (i) Opposite sides are equal.
  (ii) Opposite angles are equal.
  (iii) Diagonals bisect each other.
  (iv) A pair of opposite sides is equal and parallel.

- Note that a square, rectangles and rhombus are all parallelogram.
  - A square is a rectangle and also a rhombus.
  - A parallelogram is a trapezium.
  - A kite is not a parallelogram.
  - A trapezium is not a parallelogram.
  - A rectangle or a rhombus is not a square.


Square


Rectangle


Rhombus

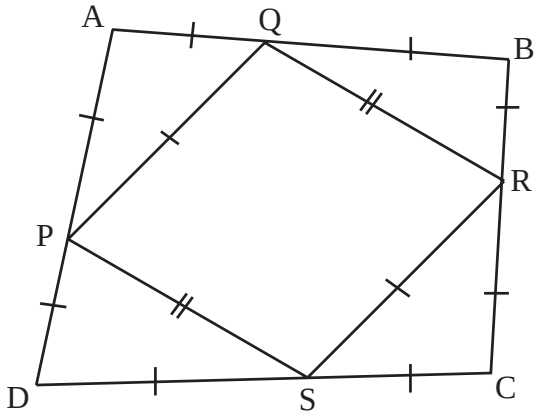
- Diagonals of a rectangle bisects each other and are equal.

- Diagonals of a rhombus bisect each other at right angles.

- Diagonals of a square bisects each other at right angles.

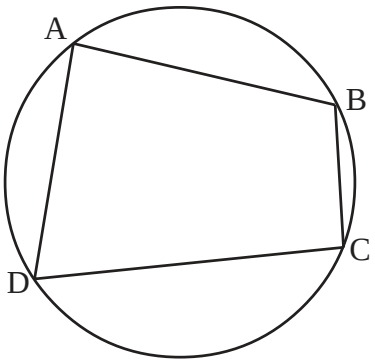
- The line segment joining the mid points of any two sides of a triangle is parallel to the third side and is half of it. And this is the mid point theorem.

- The quadrilateral formed by joining the mid points of the sides of a quadrilateral, in order is a parallelogram.
  - ABCD is a quadrilateral.
  - P, Q, R and S are mid points of the sides AD, AB, BC and CD.
  - PQRS is a IIgm.



- If all the four vertices of the quadrilateral lie on a circle then the quadrilateral is called cyclic quadrilateral.

- Sum of opposite angles of a cyclic quadrilateral is 180°.



$A \quad C \quad 180$

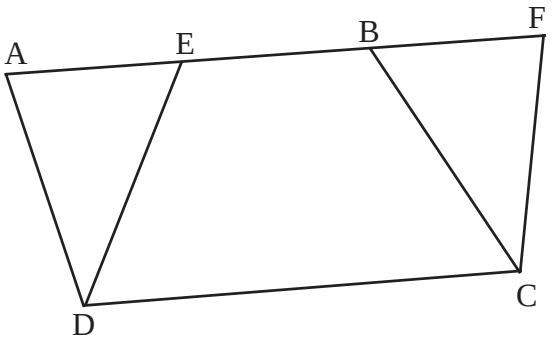
$B \quad D \quad 180$

- If the sum of pair of opposite angles of a quadrilateral is 180°, the quadrilateral is cyclic.

AREA OF PARALLELOGRAMS & TRIANGLES

- Two congruent figures have equal areas but the converse need not to be true.

- Parallelograms on the same base (or equal bases) and between the same parallels are equal in area.
  ar (ABCD) = ar (EFCD)

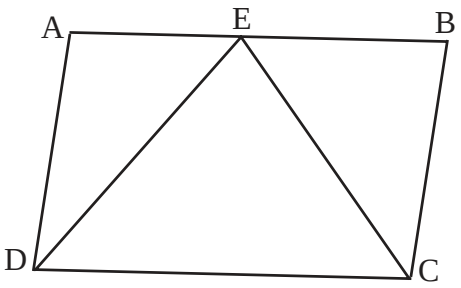


- Area of IIgm = Base x Altitude

- IIgm of the same base and having equal areas lie between the same parallels.

- If the parallelogram and the triangles are on the same base and between the same parallels, then area of the triangle is half the area of the parallelogram.

$ar(EDC) \quad \frac{1}{2} ar(ABCD)$

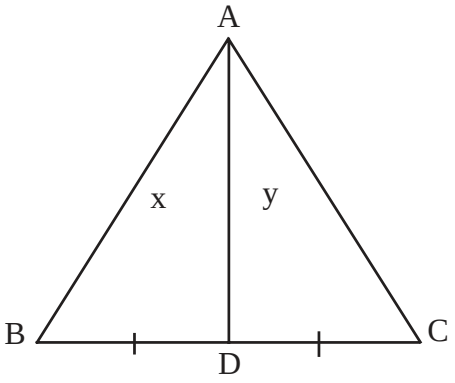


- Triangles on the same base and between the same parallels are equal in area.

- Area of a triangle = $\frac{1}{2}$ x base x altitude

- Triangles on the same base and having equal areas lie between the same parallels.

- A median of a triangle divides it into two triangles of equal areas.
  $ar(\ x) \quad ar(\ y)$. If AD is median.



(Chapter-8)

Quadrilaterals

1. What is the sum of all interior angles of a quadrilateral?

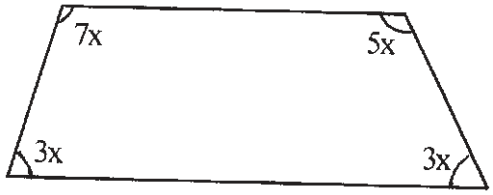
2. If four angles of a quadrilateral are in the ratio of $1:2:4:5$. Find the angles.

3. In a quadrilateral, if two $\angle s$ are right angles and other two angles are in the ratio $1:2$. Find these angles.

4. In a quadrilateral, if two $\angle s$ are complementary and other two $\angle s$ are in the ratio $4:5$. Find the measure of these two $\angle s$.

5. Three $\angle s$ of a quadrilateral, are 49°, 70° and 121°. Find the fourth angle.

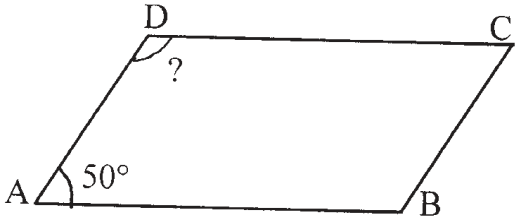
6. In the given figure find the value of x.



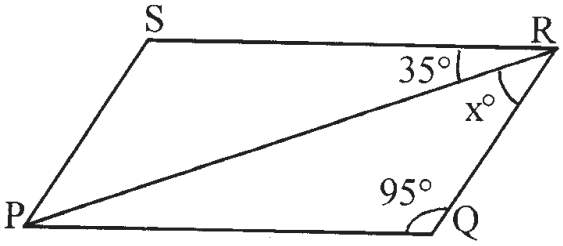
7. If four angles of a quadrilateral are in the ratio $2:3:6:7$. Find the four angles.

8. In a $\| gm$ if, one angle is 90° then find the other three angles.

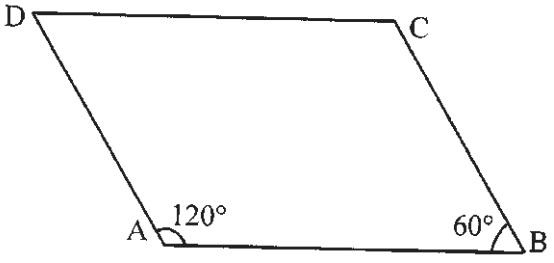
9. In the given figure ABCD is $\| gm$. Find $\angle D$



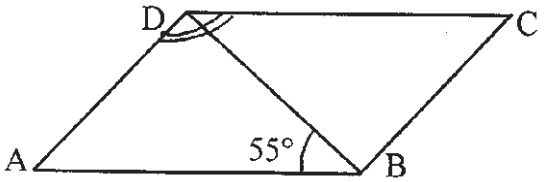
10. In the figure PQRS is $\| gm$. Find $\angle x$.



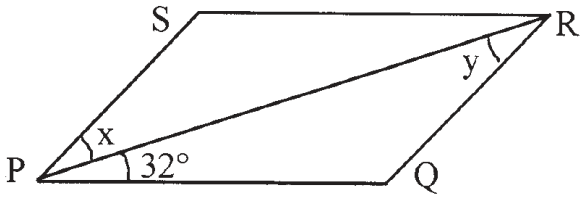
11. In the given figure ABCD is a $\| gm$. Find $\angle D$ and $\angle C$.



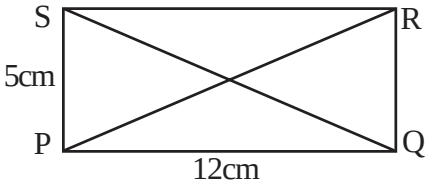
12. In given ABCD is a $\| gm$. Find $\angle ADC$.



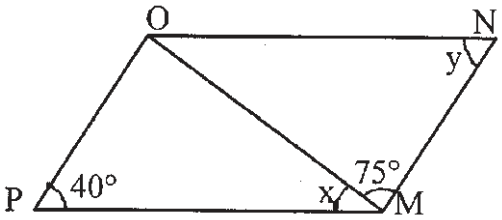
13. Find $x+y$ in the given figure if PQRS is a $\| gm$.



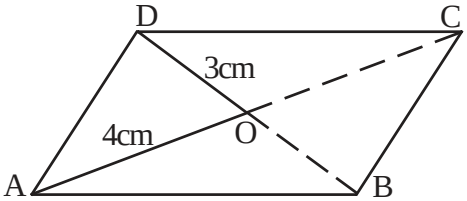
14. In the given figure PQRS is a rectangle. Find PR +QS.



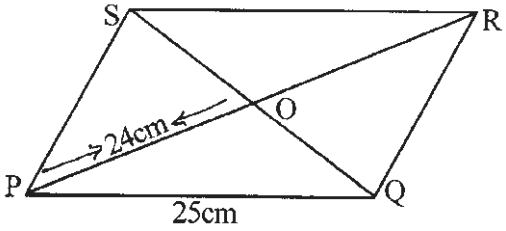
15. Find x y in the $\| gm$ $MNOP$.



16. ABCD is a rhombus. Find the perimeter of ABCD.



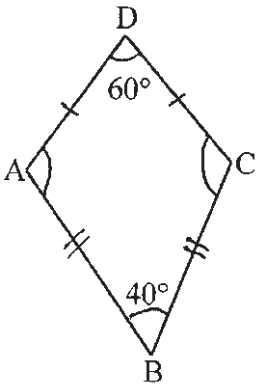
17. Find the sum of length of diagonals in Rhombus PQRS.



18. Four angles of a quadrilateral are in the ratio $3:5:9:13$. Find the measure of greatest angle.

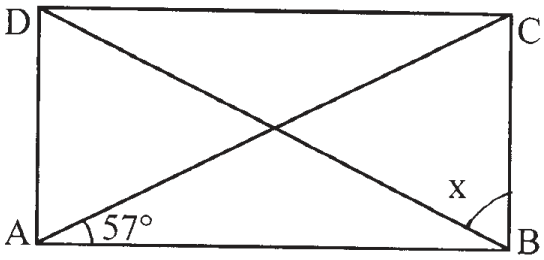
19. In a quadrilateral, if one angle is of measure 100° and other three angles are in the ratio $1:5:7$ then find the measure of other three $\angle s$.

20. In the figure find $\angle A$ & $\angle C$ if AD = DC and AB = BC

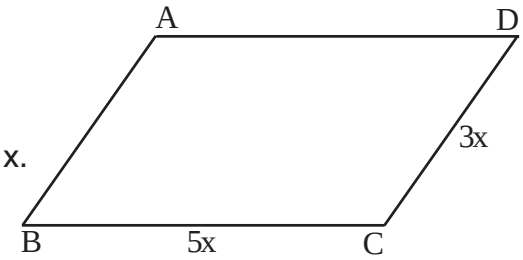


21. In a Rhombus ABCD find the sum of $\angle B + \angle C$.

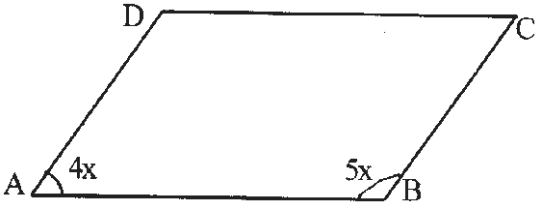
22. In the given figure ABCD is a rectangle in which $BAC \quad 57^\circ$. Find $\angle DBC$.



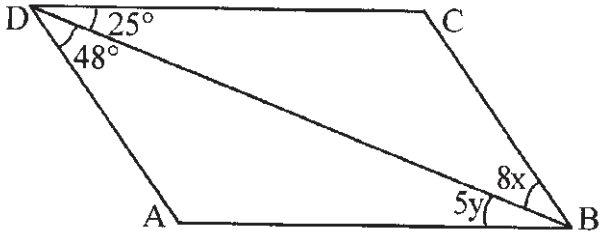
23. Perimeter of given $\| gm$ is 128 m. Find the value of x.



24. Find the value of $\angle B + \angle D$ in the given $\| gm$ ABCD.



25. Find the value of x and y in the given figure, if ABCD is a $\| gm$.

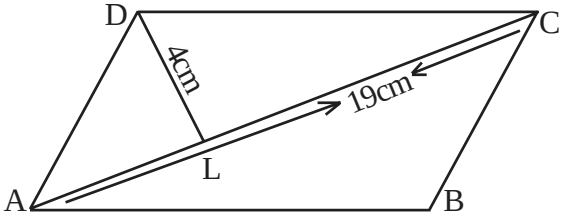


26. If the perimeter of a $\| gm$ is 14.6 cm and the longer side is 4.8 cm. Find the length of shorter side.

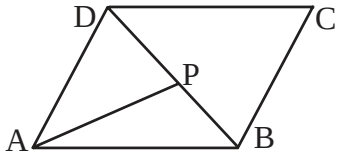
27. If the ratio of the base and area of a $\| gm$ is $1:8$ then find the length of its altitude.

28. If the ratio of the altitude and the area of the $\| gm$ is $2:11$. Find the length of the base of $\| gm$.

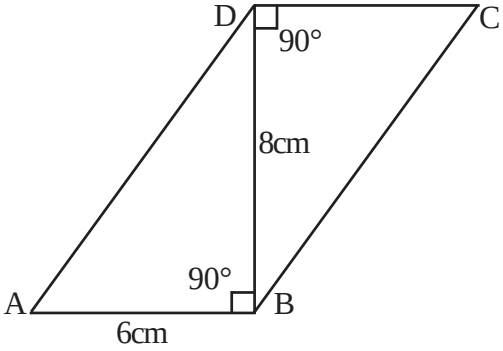
29. Find the area of ABC in the given $\| gm$ ABCD.



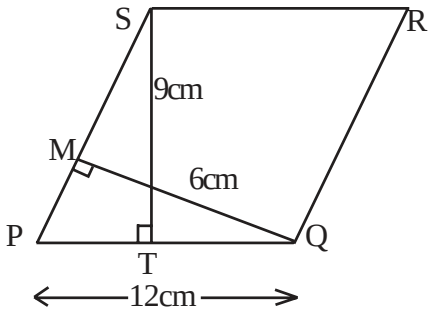
30. Find the area of $\| gm$ ABCD if AP = 5 cm and BD = 22 cm.



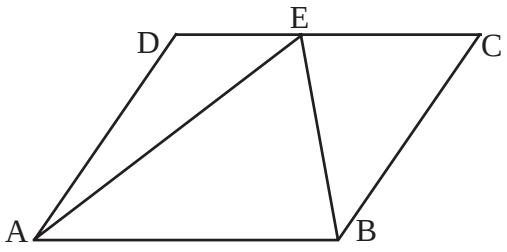
31. In the given figure find the perimeter of $\| gm$ ABCD.



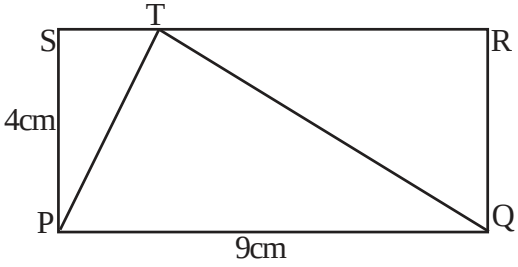
32. In the given figure PQRS is a $\| gm$ in which PQ = 12 cm, ST = 9 cm, QM = 6 cm. Find the length of SP.



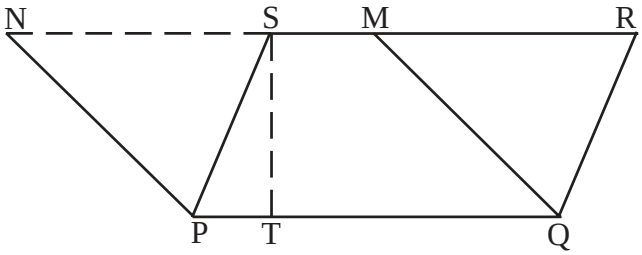
33. Find the area of AEB if area of $\| gm$ ABCD is 184 sq.cm.



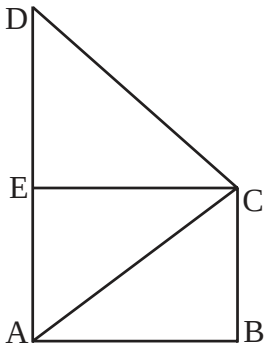
34. Find the ratio of the area of PTQ and rectangle PQRS.



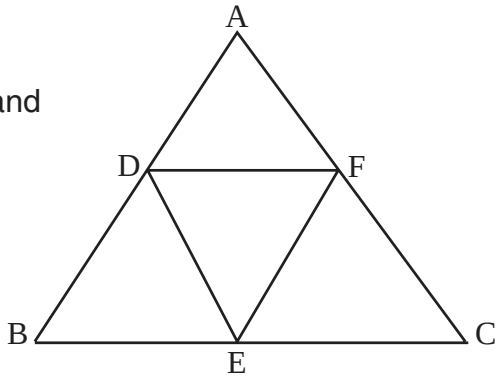
35. In the given figure $PQ \| SR$, $NR \| PQ$ and $NP \| MQ$ find the area of PQRN if PQ = 9 cm, ST = 5 cm & SM = 3 cm.



36. In the given figure $AD \| BC$, $EC \| AB$ and E is mid point of AD. If area of ABCD is 96 sq.cm. find the area of ΔEDC.

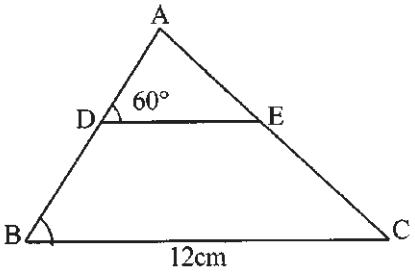


37. In the given figure D, E, F are the mid points of sides AB, BC and AC respectively. If $\angle A = 50°$, $\angle B = 60°$ and $\angle C = 70°$. Find $\angle D$, $\angle E$ and $\angle F$



38. Area of rectangle ABCD and $\| gm$ ABEF are equal in area. If base AB = 8cm and height of BC=3cm. Find the perimeter of $\| gm$ ABEF if C is the mid point of EF.

39. In the given ΔABC, D and E are the mid point of AB and AC. Find the length of DE and measure of $\angle A$



40. AD is the median of ΔABC. If area of $\Delta ABD = x cm^2$ and area of ΔABC is y cm². What is the relation between x and y?

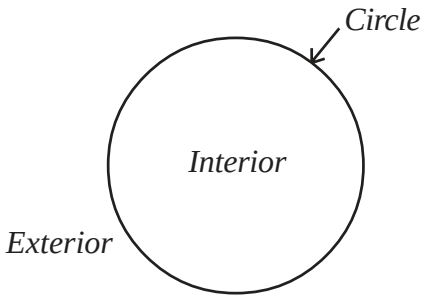
Quadrilaterals (Chapter-8)
Answers

1. 360°
2. $30^\circ, 60^\circ, 120^\circ, 150^\circ$
3. $60^\circ, 120^\circ$
4. $120^\circ, 150^\circ$
5. 120°
6. $x = 20^\circ$
7. $40^\circ, 60^\circ, 120^\circ, 140^\circ$
8. $90^\circ, 90^\circ, 90^\circ$
9. 130°
10. 50°
11. $60^\circ, 120^\circ$
12. 110°
13. 64°
14. $26cm$
15. 105°
16. $20cm$
17. $62cm$
18. 156°
19. $20^\circ, 100^\circ, 140^\circ$
20. $130^\circ, 130^\circ$
21. 180°
22. 33°
23. 8
24. 200°
25. $x = 6, y = 5$
26. 2.5
27. 8 Unit
28. 5.5 Unit
29. $38sq.cm$
30. $110sq.cm$
31. $32cm$
32. $18cm$
33. $92sq.cm$
34. $1:2$
35. $60sq.cm$
36. $32sq.cm$
37. $70^\circ, 50^\circ, 60^\circ$
38. $26cm$
39. $6cm, 60^\circ$
40. $y = 2x$

(Chapter-9)

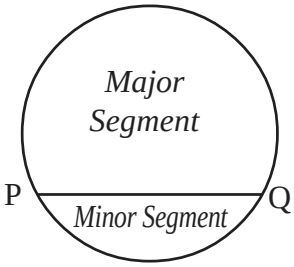
Circles

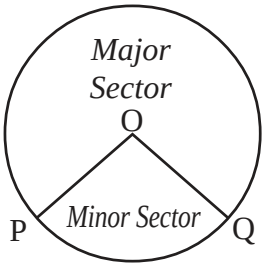
- A circle divides the plane on which it lies into three parts.
  (i) Interior
  (ii) The circle
  (iii) Exterior



- The longest chord of a circle is a diametre of a circle.

- Major segment or Major sectors





- Equal chords of a circle subtend equal angles at the centre.

- If the angle subtended by two equal chords of a circle at the centre are equal, the chords are equal.

- The perpendicular from the centre of a circle to a chord bisects the chord.

- The line drawn through the centre of a circle to bisect a chord is prependicular to the chord.

- There is one and only one circle passing through three non collinear points.

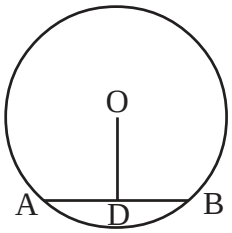
- Equal chords of a circle are equidistant from the centre.
- Chords equidistant from the centre of a circle are equal.
- Congruent arcs of a circle subtend equal angles at the centre.
- The angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.
- Angle in the same segment of a circle are equal.
- Angle in a semi circle is a right angle.

(Chapter-9)

Circles

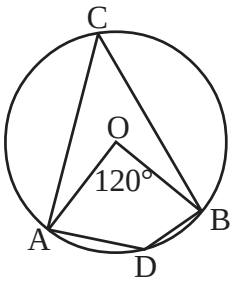
1. How many circles can be drawn through three non-collinear points?

2. In the given figure, D is the mid point of chord AB. Find $\angle ODA$.

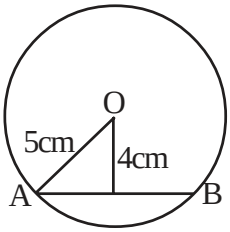


3. ABCD is a cyclic quadrilateral. If $A \quad 95^\circ$ then find the measure of $\angle C$.

4. In the figure $AOB \quad 120^\circ$. Find ACB.



5. In the figure chord AB is at a distance of 4 cm from the centre O of the circle. If the radius of circle is 5 cm. Find the length of chord AB.



6. In a circle with center O, $\angle AOB = 60^\circ$. Find reflex $\angle AOB$.

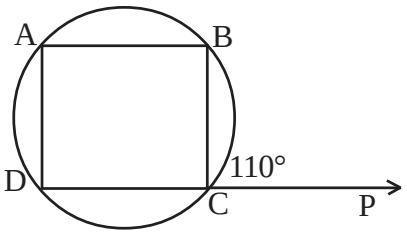
7. If ABCD is a cyclic quadrilateral, what is the sum of $\angle A$ and $\angle C$?

8. What type of angle is formed in a Major segment of a circle?

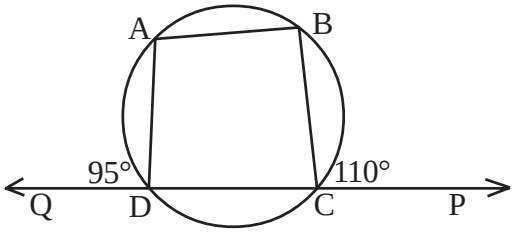
9. What is the type of angle formed in a Minor segment of a circle?

10. If AB is a diameter of a circle with center O. C is any point on the circle. Find $\angle ACB$.

11. In the figure ABCD is a cyclic quadrilateral. Side DC of the quadrilateral is produced to point P. If $\angle BCP = 110^\circ$, find $\angle A$.

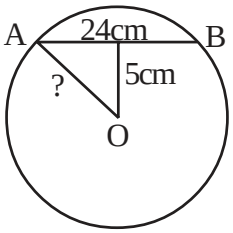


12. In the figure ABCD is a cyclic quadrilateral. Side CD is produced to both sides so that $\angle BCP = 110^\circ$ and $\angle ADQ = 95^\circ$. What is the sum of angles $\angle A$ and $\angle B$?

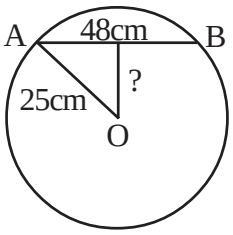


13. ABCD is a cyclic quadrilateral. If $\angle A = 110^\circ$ and $\angle B = 60^\circ$. Find the sum of $\angle B$ and $\angle C$.

14. In the adjoining figure, chord AB is at a distance of 5 cms from centre O of the circle. Find radius of circle if length of the chord is 24 cm.

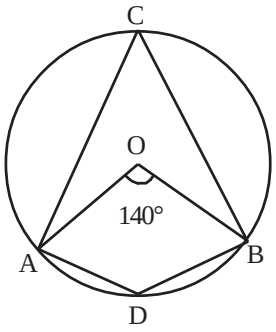


15. In the figure length of the chord of a circle of radius 25 cms is 48 cm. Find the distance of chord from the centre of circle.

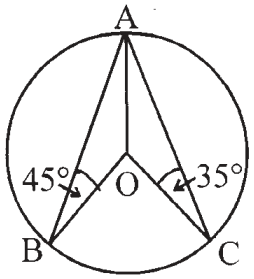


16. In a circle with centre O, two chords AB and CD are equidistant from the centre. If AB = 8 cm, what is the length of CD?

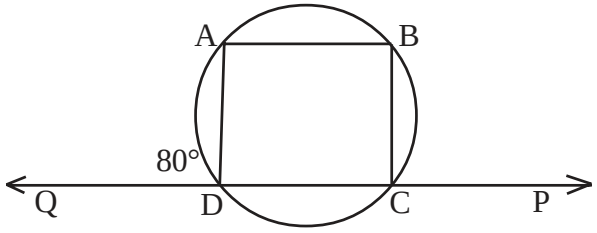
17. In the figure $\angle AOB = 140^\circ$. Find $\angle ADB$.



18. In the figure, find $\angle BOC$.

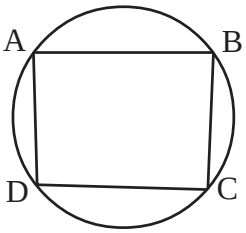


19. ABCD is a cyclic quadrilateral in which $AB \parallel CD$. If side CD is produced to both sides and $\angle ADQ = 80^\circ$ then find $\angle BCP$.

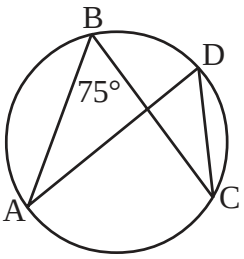


20. The two angles $\angle P$ and $\angle R$ of a cyclic quadrilateral PQRS are in the ratio $1:2$. Find the two angles $\angle P$ and $\angle R$.

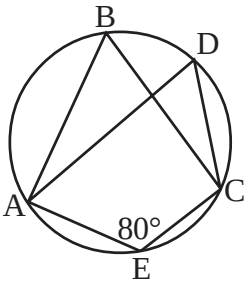
21. In the figure ABCD is a cyclic quadrilateral in which $AB \parallel CD$ and $AD \parallel BC$. Find $\angle DAB$.



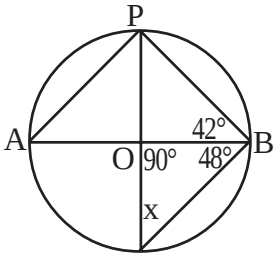
22. In the figure $\angle ABC = 75^\circ$. Find $\angle ADC$.



23. In the figure ABCE is a cyclic quadrilateral.
If $\angle AEC = 80^\circ$, then find $\angle ADC$.



24. In the figure find x.

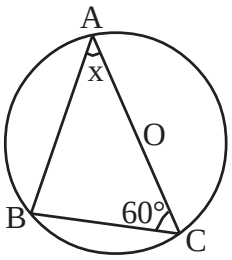


25. Greatest chord of a circle is called _____.

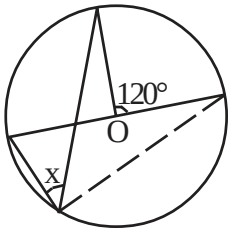
26. Complete the sentence :- In a circle the chord nearer to the centre of circle is _____.

27. A chord of a circle subtend equal angles at two points on the same side of the chord, then the four points are _____.

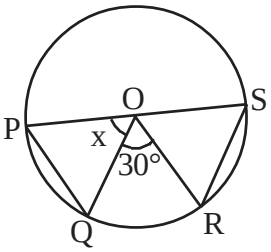
28. Find x in the figure.



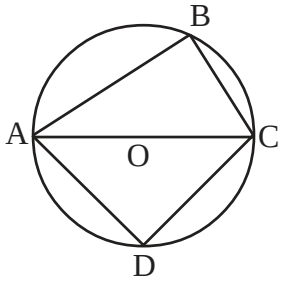
29. Find x in the figure.



30. In the figure PQ = RS and PS is the diameter of the circle. Find x.



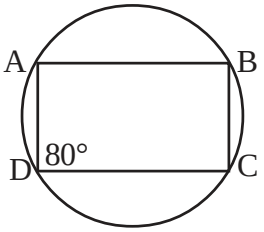
31. In the figure diagonal of a cyclic quadrilateral passes through the centre O of the circle. Find the measures of $\angle B$ and $\angle D$.



32. Diagonals of a cyclic quadrilateral ABCD passes through the centre of the circle. What type of quadrilateral is ABCD?

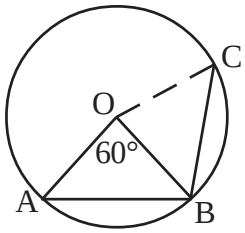
33. Two diameters of a circle are perpendicular to one another. What is the type of quadrilateral formed by joining the four points?

34. In the figure ABCD is a cyclic quadrilateral in which $AB \| CD$ and $\angle D = 80^\circ$. Find $\angle C$.

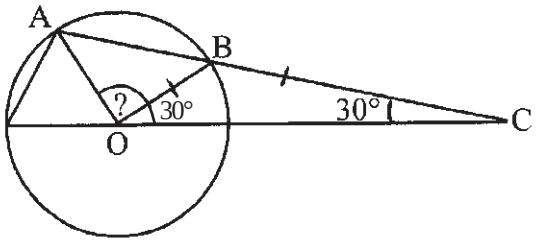


35. In the circle C (o, r), $\overset{\frown}{AB} = \overset{\frown}{CD}$. Find the length of chord AB.

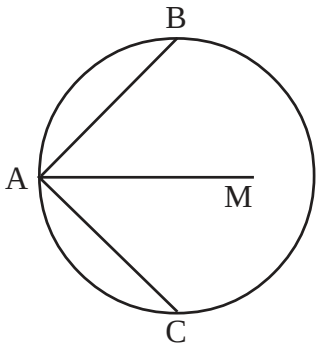
36. In the figure chord AB = chord BC. If $\angle AOB = 60^\circ$ then find $\angle AOC$.



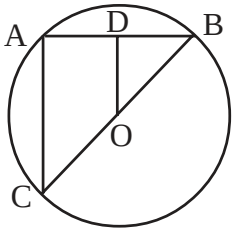
37. In the figure AB is the chord of circle which centre O. Chord AB is produced to point C in such a way that BC = OB. If $\angle OCB = 30^\circ$ then find $\angle AOB$.



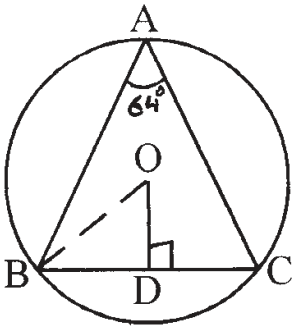
38. In the figure, two chords AB and AC of a circle are equal. AM is the bisect of $\angle CAB$. Find where is centre of circle?



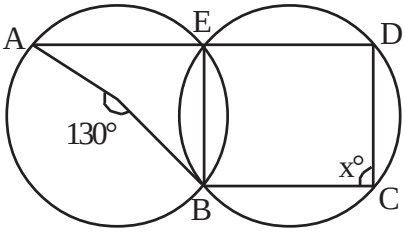
39. In figure $OD \perp AB$. If OD = 3 cm, find AC.



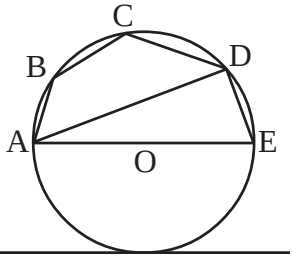
40. In the figure $OD \perp BC$. If O is the circumcenter of ABC then find $\angle OBD$.



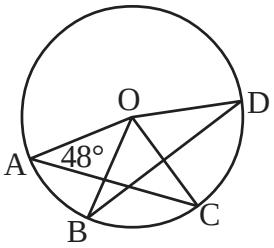
41. In the figure find x.



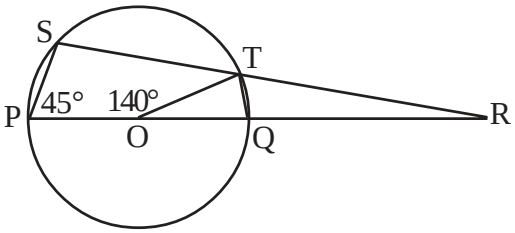
42. In the figure ABCDE is a pentagen in the semicircle. Find $\angle ABC + \angle CDE$.



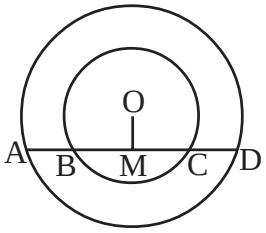
43. In the figure AC = BD. Find the relation between $\angle A$ and $\angle B$ also find $\angle B$.



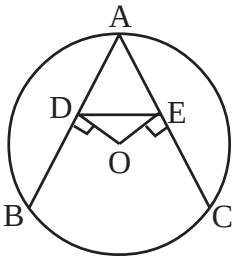
44. In the figure find $\angle RTQ$ and $\angle RQT$.



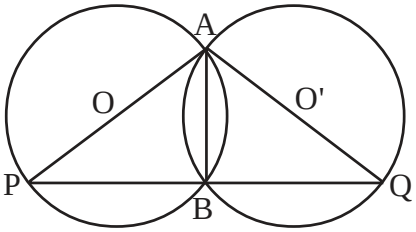
45. In the figure two concentric circles with centre O have a common tangent AD cutting the inner circle at B and C.
If $OM \perp AD$, AD = 18 cm and BM = 8 cm. Find AB.



46. AB and AC are two equal chords of a circle $OD \perp AB$ and $OE \perp AC$. What type of triangle is ADE?

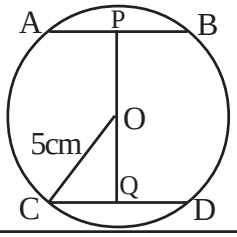


47. Two circles with centres O and O^1 intersect at A and B. Find $\angle PBQ$.



48. PQ is a chord of circle with radius 'r'. If A is any point on the circle such that $\angle PAQ = 90^\circ$ then find PQ.

49. In the figure, O is the centre of circle with radius 5 cm. If $OP \perp AB$, $OQ \perp CD$ and $AB \parallel CD$, AB = 8cm, CD = 6 cm. Find PQ.



Circles (Chapter-9)
Answers

1. One
2. 90°
3. 85°
4. 60°
5. 6 cm
6. 300°
7. 180°
8. Acute angle
9. Obtuse angle
10. 90°
11. 110°
12. 205°
13. 130°
14. 13 cm
15. 7 cm
16. 8 cm
17. 110°
18. 160°
19. 80°
20. $\angle P = 60^\circ$ and $\angle R = 120^\circ$
21. 90°
22. 75°
23. 100°
24. 48°
25. Diameter
26. Greater
27. On the circle
28. 30°
29. 30°
30. 75°
31. $B \quad 90^\circ$ and $D \quad 90^\circ$
32. Rectangle
33. Square
34. 80°
35. Equal to chord CD
36. 120°
37. 60°
38. On the line AM
39. 6 cm
40. 26°
41. 65°
42. 270°
43. $\angle A = \angle B$ and $\angle B = 48^\circ$
44. $\angle RTQ = 45^\circ$ and $\angle RQT = 110^\circ$
45. 1 c.
46. Isosceles triangle
47. 180°
48. 2 r
49. 7 cm

(Chapter-10)

Heron's Formula

- Area of a triangle with its sides as a, b and c – by using Heron's formula

  Area of Triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

  where $s = \frac{a+b+c}{2}$

- Area of quadrilateral whose sides and one diagonal are given, can be calculated by dividing the quadrilateral into two triangles and using the Heron's formula.

- To multiply any number by –11

  –> let take no. 132

  132 x 11 = __ __ __ __

  –> 132 x 11 = 1(3+1)(3+2)2

  132 x 11 = 1452

- Area of equilateral triangle = $\frac{\sqrt{3}}{4} x(side)^2$

(Chapter-10)

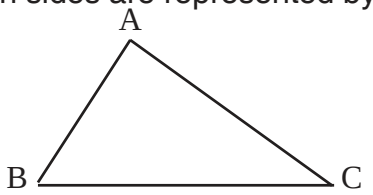
Heron's Formula

1. Give Heron's formula for finding area of triangle.

2. What are a, b and c used in Heron's formula?

3. If a = 12 cm, b = 13 cm, c = 15 cm, what is the value of s?

4. In the triangle given below which sides are represented by a, b and c?

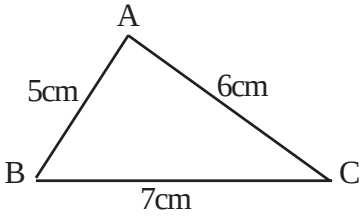


5. Fill in the blank :- $s = \frac{?}{2}$

6. If a = 25 cm, b = 15 cm and c = 20 cm, what is the value of (s – b)?

7. Sides of a triangular plot are in the ratio $2:3:4$ and its perimeter is 36 then the three sides are __, __ and __.

8. Find s if



9. Area of an equilateral triangle with side 6 cm is _____?

10. In a triangle a = 15 cm, b = 7 cm and s = 15 cm, find the length of side C.

11. In an equilateral triangle s = 30 cm, what is the length of each side?

12. Area of triangle when Heron's formula is applied is $\sqrt{15\times9\times5\times3}$. Find it in simplified form.

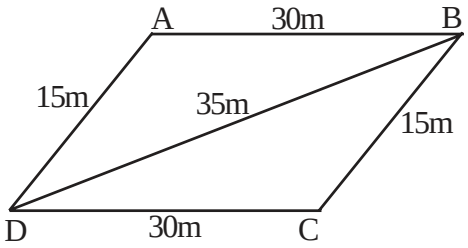
13. Evaluate $\sqrt{18\times8\times9} = ?$

14. If in a triangle s – a = 7 cm, s – b = 8 cm and s – c = 6 cm, then s = ?

15. In an equilateral triangle with one side x
$s = ? x$.

16. In a triangle ABC, $a = 3b = 6c$ then $S = ? \times C$. Complete it.

17. In the adjoining figure, find s for $\triangle ABD$ and $\triangle BCD$.



18. The sides of a triangle are in the ratio $2:3:5$. If the perimeter of triangle is 50m. Find the three sides.

19. The three sides of a triangle are a= 12 cm, b = 14 cm, c = 20 cm. Complete it :-
Area of triangle is $\sqrt{\_\_ \times \_\_ \times 9 \times 3}$

20. If s – a = 12 cm, s – b = 9 cm, s – c = 4 cm, then s = ?

21. In a triangle ABC, side opposite to vertex B = ? and side opposite to vertex C = ?

22. Complete it :- Area of equilateral triangle = $\frac{\sqrt{3}}{4} \times \_\_\_$

23. In an equilateral triangle s $\frac{3}{2}$ a. Find perimeter of the triangle.
(Where a is the side of triangle)

Heron's Formula (Chapter-10)
Answers

1. $\sqrt{s(s-a)(s-b)(s-c)}$

2. a, b and c are sides of the triangle

3. 20 c.m.

4. $AB \quad c$, $BC \quad a$, $AC \quad b$

   Can take any of the sides as **a**, 2nd **b** and remaining **c**.

5. a+b+c

6. 15 c.m.

7. 8 cm., 12 cm. and 16 cm.

8. 9 cm.

9. $9\sqrt{3}cm^2$

10. 8 cm.

11. 20 cm.

12. 45 unit²

13. 36

14. 21cm

15. $\frac{3}{2}$

16. $\frac{9}{2}$

17. 40cm each

18. 10 cm., 15 cm., 25 cm.

19. $\sqrt{23\times11\times9\times3}$

20. 25 cm.

21. AC, AB

22. a^2 or side²

23. 3a

(Chapter-11)

Surface Area And Volume

◆ Useful 2-dimensional figures

FIGURE	AREA	Perimeter / Circumferance
SQURE	A = Side x Side	P = 4 x side
RECTANGLE	A = length x breadth	P = 2(l+b)
TRIANGLE	A= 1/2 x base x altitude	P = sum of three sides
llgm	A = base x altitude	P = 2 x sum of adjecent sides
RHOMBUS	A = b x h or $1/2d_1 \times d_2$	P = 4 x sides
TRAPEZIUM	A = 1/2 (sum of ll sides) x h	P = sum of 4 sides
EQUILATERAL	A = $\frac{\sqrt{3}}{4}$ x (side)²	P = 3 x side
CIRCLE	A = x (radius)²	C = 2 x (radius)
SEMI CIRCLE	A = 1/2 r²	C = r + 2r

◆ Cuboid

$(l \quad b \quad h)^2 \quad (Diagonal)^2 \quad 2(lb \quad bh \quad lh)$

$(l \quad b \quad h)^2 \quad (\sqrt{l^2 \quad b^2 \quad h^2})^2 \quad 2(lb \quad bh \quad lh)$

◆ 3 - Dimensional Figures

Shape	Volume	Curved or lateral surface area	Total surface area
CUBOID	$V \quad l \quad b \quad h$	$2(l \quad b)h$	$S \quad 2(lb \quad bh \quad lh)$
CUBE	$V \quad a^3$	$4a^2$	$S \quad 6 \quad a^2$
CYLINDER	$V \quad r^2h$	$S \quad 2 \quad rh$	$S \quad 2 \quad r(h \quad r) \quad 2 \quad rh \quad r^2$ if open at the top
CONE	$V \quad \frac{1}{3} \quad r^2h$	$S \quad rl$ where $l \quad \sqrt{h^2 \quad r^2}$	$S \quad rl \quad r^2$

SPHERE	$V \quad 4/3 \quad r^3$	$4 \quad r^2$	$S \quad 4 \quad r^2$
HEMISPHERE	$V \quad 2/3 \quad r^3$	$S \quad 2 \quad r^2$	$S \quad 3 \quad r^2$

- Cube / Cuboid / Cylinder

$$h \quad \frac{Volume}{Area \text{ of base}}$$

$$Cone.h \quad \frac{3 \; Volume}{Area \text{ of base}}$$

- Area of 4 walls = 2(l + b)h

- If, V = SA of a sphere, then, r = 3 and d = 6

- If 2 cylinder / cone

Equal volumes

$$\frac{h_1}{h_2} \quad \frac{r_2}{r_1}^{2}$$

$$\frac{r_1}{r_2} \quad \sqrt{\frac{h_2}{h_1}}$$

Ratio of volume is given

$$\frac{h_1}{h_2} \quad \frac{r_2}{r_1}^{2} \quad \frac{v_1}{v_2}$$

$$\frac{r_1}{r_2} \quad \sqrt{\frac{h_2}{h_1}} \quad \frac{v_1}{v_2}$$

- Diagonal of cube = $\sqrt{3} \quad a$ [a = side]

- Diagonal of a cuboid = $\sqrt{l^2 \quad b^2 \quad h^2}$

(Chapter-11)

Surface Area And Volume

1. An underground water tank is in the shape of cube of side 7 m. What will be its volume?

2. What will be volume of a box whose length 16 m, breadth 8 m and height is 5 m?

3. The length, breadth and height of a room are 12 m, 10 m, and 9m respectively. Find the area of four walls of room?

4. The volume of a cube is $27a^3$. Find the length of its edge?

5. How much Aluminium sheet will be required to make a container with lid whose length is 13 m, breadth is 8 m and height is 4 m?

6. The volume of a cube is $1331\,cm^3$. Find the length of its edge?

7. The length of diagonal of a cube is 17.32 cm. Find the volume of that cube?

8. Three cubes whose sides are 6 cm, 8 cm and 10 cm. They are melted and form a cube. Find the volume of that cube?

9. Two cubes have edge 10 m. Their edges have been joined and form a cuboid. What will be the surface area of cuboid thus formed?

10. The total volume of a cube is 512 cubic cm. Find the side of a cube?

11. A rectangular box 14 cm long, 10 cm wide and 5 cm high is to be made with card-board. Find the area of card-board to make that box?

12. What will be the volume of a cylindrical tank whose radius is 7 cm and height is 5 cm?

13. How many solid spheres of $\frac{2}{3}cm$ radius can be made from a solid sphere of 2 cm radius?

14. If the volume and surface area of a sphere is numerically same then what will be its radius?

15. The volume of a right circular cylinder is $392\ \pi\ cm^3$ and its height is 8 cm. Find the radius?

16. The surface area of a sphere is $448\ \pi\ cm^2$. Find its radius?

17. What will be the edge of a cube? If its surface area is $324 \text{ sq } cm$.

18. The volume of a hemisphere is $144\ \pi$ cm³. What will be its radius?

19. The curved surface area of a cone is $140\ \pi$ cm². What will be the radius of cone whose slant height is 5 cm.

20. The radius of a solid sphere is 12 cm. How many sphere can be made from it of 6cm radius?

21. The volume of a cuboid is 840 cm³. If its length is 14 cm and breadth is 5 cm. Find the height of cuboid?

22. Four equal cubes have side 5 cm each. They are joined together edge to edge. What will be the surface area of cuboid thus formed?

23. The area of a rhombus is $56\ cm^2$ and its diagonal is 7 cm. Find the length of other diagonal of the rhombus?

24. Find the maximum length of the rod that can be kept in cyboidal box of sides 30cm, 24cm and 18cm.

25. The curved surface area of a cylinder is $216\ \pi$. If its height is 18 cm then what will be its radius?

26. 60 circular plates of equal radius are placed on each other to form a cylinder. Find height of cylinder if thickness of each plate if 3/4 cm.

27. Curved surface area of a cone is thrice and curved surface area of the other. Slant height of second cone is thrice the slant height of first. Find ratio of their radii.

28. A well of 2m diameter is dug 14m deep on the ground. Find the volume of earth taken out.

29. Volume of a solid sphere is $36\pi cm^3$. Find its radius.

30. A boy recasted a cone of 4cm height and 27cm radius into a solid sphere. Find the radius of the sphere.

Surface Area And Volume (Chapter-11)
Answers

1. 343m³
2. 640m³
3. 396m²
4. 3a
5. 376m²
6. 11cm
7. 1000cm³
8. 1728cm³
9. 1000m²
10. 8cm
11. 520cm²
12. 770cm²
13. 27
14. 3 units
15. 7cm
16. $\sqrt{112}cm$ or $4\sqrt{7}cm$
17. 9cm
18. 6cm
19. 28cm
20. 8
21. 12cm
22. 450cm²
23. 16cm
24. $\sqrt{1800}cm$ or $30\sqrt{2}cm$
25. 6cm
26. 45cm
27. 9:1
28. 44m³
29. 3cm
30. 9cm

(Chapter-12)

Statistics

- Mean = $\frac{\text{Sum of observations}}{\text{number of observations}}$

- Median :–

  If 'n' is odd number median = $\frac{n+1}{2}^{th}$ term

  If 'n' is even number median = $\frac{\frac{n}{2}^{th} \text{ term} \quad \frac{n}{2} \; 1 \text{ term}}{2}$

- Mode : the mode is most frequently occuring observation

- Sum of first n natural numbers = $\frac{n(n \quad 1)}{2}$

- $1^2 + 2^2 +$ __ __ __ __ __ $+ n^2$

  Sum of squares of first n natural numbers = $\frac{n(n \quad 1)(2n \quad 1)}{6}$

- $1^3 + 2^3 +$ __ __ __ __ __ $+ n^3$

  Sum of cubes of first 'n' natural numbers = $\frac{n(n \quad 1)}{2}^{2}$

(Chapter-12)

Statistics

1. For the class interval 21-25, what is the upper limit?

2. What is the class mark for the class interval 18-26?

3. What is the range for the given data :-
   31, 32.5, 20.3, 27.9, 28, 19.7, 31.7.

4. If the Tally marks of a given data is $\cancel{||||}\ ||||$ then what is its frequency.

5. Given below is the no. of goals made by a team in 10 matches :-
   2, 3, 5, 4, 0, 1, 3, 3, 4, 3
   Find the mean.

6. Find the median for the above Q. 5

7. 2, 3, 4, 5, 0, 1, 3, 3, 4, 3 find the mode for the given data.

8. Find the mode for the data given below :-
   14, 25, 14, 28, 18, 17, 14, 23, 22, 14, 18.

9. If the mean of 6, 8, 5, 7, x and 4 is 7 then find the value of x.

10. If the mean for 10 observations is 20 and mean for other 15 observation is 16 then find the mean for all 25 observations.

11. Find the mean for :-
    4, 3, 7, 0, 0, 6, 8.

12. Find the mode for the following :-
    7, 9, 12, 13, 7, 12, 15, 7, 12, 7, 25, 18, 7.

13. The mean for three nos. is 6. If two of them are 5 & 8 respectively then find the third number.

14. If means of x_1, x_2 is 6 and mean of x_1, x_2 and x_3 is 7 then find x_3.

15. Find the mean of first three natural numbers.

16. If 3 is the mean for x, 3, 4, 5 then find the value of x.

17. Find the mean for first three whole numbers.

18. What is the mean of p, q and r.

19. The mean of 4, 4, 3, 5, 6, 2, is ____.

20. One student has scored the marks in five subject as below :-
70, 64, 56, 54, 51.
find the mean.

21. For which value of p, the data given below has mode 5.
1, 2, 5, 7, 5, 2, 7, 5, 9, 2, 3, p, 11

22. Find the median :-
36, 39, 42, 48, 52, 68, 69, 71, 72, 78.

23. The class marks are given below :-
47, 52, 57, 62, 67, 72, 77, 82
What is the class size?

24. Find the class limit for the first class marks of above Q.

25. What is the range of 40, 42, 80, 69, 56, 47?

Statistics (Chapter-12)
Answers

1. 25
2. 22
3. 12.8
4. 9
5. 2.8
6. 3
7. 3
8. 14
9. 12
10. 17.6
11. 4
12. 7
13. 5
14. 9
15. 2
16. 0
17. 1
18. $\frac{p+q+r}{3}$
19. 4
20. 59
21. 5
22. 60
23. 5
24. 44.5-49.5
25. 40

(Chapter-13)

Probability

- Probability P(E) of an event E is given by :–

  $$P(E) \quad \frac{\text{Number of trials in which E has happened}}{\text{Total number of trials}}$$

- The probability of an event lies between 0 and 1 [(0 and 1) inclusive] = $0 \quad P(E) \quad 1$

- The probability of a sure event is 1

- The probability of an impossible event is 0.

- The sum of the probabilities of all the elementary events of an experiment is 1

- For any event E,

  $P(E) \quad P(\bar{E}) \quad 1$

  where $\bar{E}$ stands for (not E).

(Chapter-13)

Probability

1. A coin is tossed once, find the probability of getting 'Head'?

2. In a pack of 52 cards what is the probability of getting a face card?

3. A dice is tossed once find the probability of getting a 'prime number'

4. A dice is tossed once find the probability of getting a number less than 5.

5. In a pack of 52 cards find the probability of getting two of spades.

6. In a cricket match, a batsman hits a boundary of 5 times out of 30 balls he plays. Find the probability that he did not hit a boundary.

7. In a bag there are 5 white, 4 black, 3 red balls. One ball is picked up randomly what is the probability of getting a black ball?

8. A coin is tossed 500 times with following frequencies :-
Head - 245, Tail - 255. What is the probability of getting head?

9. In 250 consecutive days weather forecasts were correct 175 times. Find the probability of getting 'not correct' forecast?

10. In class IX total students were 36. Out of which 20 students are boys. Find the probability of girls in the class?

11. Between 5 and 15 numbers find the probability of having an odd number.

12. In 1500 families, 814 families have 2 children and rest of families have 1 child. Find the probability of families having 1 child?

13. In word 'INDIA' what is the probability of getting letter 'I'?

14. In a bag of 56 apples, 19 were rotten. One apple is chosen at random. Find the probability of getting a fresh apple?

15. A dice is tossed once, what is the probability of getting number '7'?

16. In a bag there are 5 white, 6 black and 3 green cards. One card is drawn at random. What is the probability of having a card which is not green?

17. In a class of 50 students 70% were passed. What is the probability of a failing child?

18. In a football team wining possibility is 0.4. What is probability of loosing the game?

19. In a pack of 52 cards what is the probability of getting a red king?

20. In a locality there are 67 vehicles. In which 39 are black. What is the probability of a vehicle which is not black?

21. A survey of 250 students was conducted about the subject 'Statistics'. In which 143 students like statistics. Find the probability of a students who does not like statistics?

22. In word 'CLASSES'. What is the probability of getting letter 'S'?

23. In a class of 47 students, 29 students studies Home Science and rest students studies Drawing. Find the probability of Drawing students?

24. In word 'MATHEMATICS'. What is the probability of a vowel?

25. Between 1 – 70, what is the probability of numbers which are divisible by '7'?

Probability (Chapter-13)
Answers

1. $\frac{1}{2}$

2. $\frac{3}{13}$

3. $\frac{1}{2}$

4. $\frac{2}{3}$

5. $\frac{1}{52}$

6. $\frac{5}{6}$

7. $\frac{1}{3}$

8. $\frac{49}{100}$

9. $\frac{3}{10}$

10. $\frac{4}{9}$

11. $\frac{4}{9}$

12. $\frac{343}{750}$

13. $\frac{2}{5}$

14. $\frac{37}{56}$

15. 0

16. $\frac{11}{14}$

17. $\frac{3}{10}$

18. 0.6

19. $\frac{1}{26}$

20. $\frac{28}{67}$

21. $\frac{107}{250}$

22. $\frac{3}{7}$

23. $\frac{18}{47}$

24. $\frac{4}{11}$

25. $\frac{9}{68}$.