SCHEDULE OF QUIZ COMPETITIONS OF THE YEAR 2009-10

❑ Preparation from Question Banks and Practice to Students   01.07.09 to 22.10.09

❑ School level Quiz Competition   23.10.09 to 24.10.09

❑ Cluster level Quiz Competition   17.11.09 to 20.11.09

❑ Zonal Level Quiz Competition   01.12.09 to 04.12.09

❑ District level Quiz Competition   04.01.10 to 06.01.10

❑ Regional level Quiz Competition   11.01.10 to 13.01.10

❑ State level Quiz Competition   First Week of February

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CLASS VII

MATHEMATICS

INDEX

CHAPTER 1

INTEGERS

Points to Remember :

- ❑ Addition is commutative for integers, *i.e.*
  $a + b = b + a$ for all integers a and b.

- ❑ Addition is associative for integers, *i.e.*
  $(a + b) + c = a + (b + c)$ for all integers a, b and c.

- ❑ Multiplication is commutative for integers, *i.e.*
  $a \times b = b \times a$ for any integers a and b.

- ❑ Multiplication is associative for integers, *i.e.*
  $(a \times b) \times c = a \times (b \times c)$ for any three integers a, b and c.

- ❑ Product of even number of negative integers is positive, whereas the product of odd numbers of negative integers is negative.

QUESTIONS

Evaluate

1. $-32 + 47$

2. What will be the sum of (-2035) and 285?

3. What will be the sum of (-1006) and (-934)?

4. Subtract (-56) from 144.

5. Subtract the sum of -1878 and 878 from 2000.

6. Subtract -134 from the sum of 37 and -87.

7. What is the difference between $[36 - (-64)$ and $(-64) - 36]$

8. Simplify : $\{-13 - (-27)\} + \{-25 - (-40)\}$

9. The sum of two integers is (-16). If one of them is 53, find the other.

10. The sum of two integers is 65. If one of them is -35, find the other.

11. Multiply (–36) by (–50).

12. Find the product of (–25) and (14).

13. What will be the product of (–53) and (18).

14. Find the product : (–2) × 36 × (–5).

15. Find the product of 2 × (–27) × 15.

16. Multiply : (–2) × (–4) × (–5) × (–8)

17. Which integer if multiplied by (–1) will be 432 ?

18. Find the sum of (8 + 9) × 10 and 8 + 9 × 10.

19. Find the value of 1569 × 887 – 569 × 887.

20. Find the value of 625 × (–2) + (–625) × 98.

21. Divide (–98) by (–14)

22. Divide 324 by (–27).

23. What will be the quotient if (–15625) is divided by (–125) ?

24. Simplify : (|–17| + |17|) ÷ |–2|.

25. Simplify : (–20) + (–8) ÷ (–2) × 3.

26. Find the value of 16 + 8 ÷ 4 – 2 × 3.

27. Find the value of 13 – (15 – 6 ÷ 3).

28. Evaluate : (–1) × (–2) × (–3) × (–4) × (–5).

29. What will be the value of a if a × (–2) = (–30)?

30. What will be the value of P if P × (–8) = 120?

31. Find the value of (–23) {(–5) + (25)}

32. Determine the integer whose product by –3 become zero.

33. Find the product of (–45) × 55 × (–10).

34. What will be the quotient if 369 is divided by (–1)?

35. Find the remainder if (–269) is divided by 269.

36. A man drives his car at the speed of 40 km/hr. How long will it take to cover 160 km?

37. An elevator descends into a mine shaft at the rate of 7 m/min. If it starts from 5 m above the ground level. How long will it take to reach 205 m down the earth?

38. A diver dives in the sea 270 m down. If the speed of diver is 3m/sec. How long will he take?

39. At Srinagar, temperature was –7°C on Tuesday and then it dropped by 2°C on Wednesday. What was the temperature of Srinagar on Wednesday?

40. If the sum of two integers is −1600 and one of them is 549, find the other number.

41. In a class test containing 10 questions, 5 marks are awarded for every correct answer and (−2) marks are awarded for every incorrect answer. Mohan gets 4 correct and 6 incorrect answers. What is his score?

42. The temperature at 1.00 p.m. was 10°C above zero. If it decreases at the rate of 2°C per hour until 10 p.m., at what time would the temperature be 6°C below zero?

43. An elevator descends into a mine shaft at the rate of 6 meter per minute. If the descentent starts from the ground level, how long will it take to reach 240 meter?

44. The product of two integers is −51. If one integer is −17, find the other.

45. Product of two integers is 630. If one integer is −30, find the other.

46. Rohit earns profit of Re. 1 by selling one pen and suffers a loss of 50 paise by selling one pencil. One day Rohit earns Rs. 5. If he sold 25 pens, how many pencils did he sell?

47. Determine the integer whose product with (−7) is 154.

48. Determine the integer when it is divided by (−9), the answer is 23.

49. Determine the integer when it is divided by (−17), the answer is 21.

50. Determine the integer whose product with (−13) is −325.

ANSWERS

1.	15	2.	−1750
3.	−1940	4.	200
5.	3000	6.	84
7.	200	8.	29
9.	−69	10.	100
11.	1800	12.	−350
13.	−954	14.	360
15.	−810	16.	320
17.	−432	18.	268
19.	887000	20.	−62500
21.	7	22.	−12
23.	125	24.	17
25.	−8	26.	12
27.	0	28.	−120

29.	15	30.	−15
31.	−460	32.	0
33.	24750	34.	−369
35.	0	36.	4 hours
37.	30 min.	38.	90 sec.
39.	−9°C.	40.	−2149
41.	8	42.	9 p.m.
43.	40 minutes	44.	3
45.	−21	46.	40 pencils
47.	−22	48.	−207
49.	−357	50.	25

CHAPTER 2

FRACTIONS AND DECIMALS

Points to Remember :

❑ The numbers of the form $\dfrac{a}{b}$, where a and b are whole numbers and $b \neq 0$ are known as fractions. For example $\dfrac{3}{5}, \dfrac{17}{6}, \dfrac{8}{1}$.

❑ $\dfrac{3}{10}, \dfrac{29}{100}, \dfrac{39}{1000}, \dfrac{423}{1000}$ are decimal fractions.

❑ $\dfrac{1}{2}$ of 2 is $\dfrac{1}{2} \times 2 = 1$.

❑ $2 \div \dfrac{3}{5} = 2 \times \dfrac{5}{3} = \dfrac{10}{3}, \quad \dfrac{2}{3} \div 7 = \dfrac{2}{3} \times \dfrac{1}{7} = \dfrac{2}{21}$.

❑ $0.5 \times 0.7 = 0.35$, $0.53 \times 10 = 5.3$, $0.53 \times 100 = 53$.

QUESTIONS

1. Add : $\dfrac{1}{7} + \dfrac{7}{9}$.

2. Find the sum of $\dfrac{7}{8}, \dfrac{5}{6}$, and $\dfrac{3}{4}$.

3. Find the sum : $3\dfrac{3}{5} + 2\dfrac{1}{5} + 4\dfrac{1}{5}$.

4. Simplify : $8 - 4\dfrac{1}{2} - 2\dfrac{1}{2}$.

5. What should be added to $7\dfrac{4}{15}$ to get $8\dfrac{2}{5}$?

6. A film show lasted for $3\dfrac{2}{3}$ hours. Out of this, $1\dfrac{1}{3}$ hours were spent on advertisements. What was the actual duration of the film?

7. Multiply : $\dfrac{14}{25} \times \dfrac{35}{68} \times \dfrac{34}{49}$.

8. Simplify : $3\dfrac{4}{7} \times 2\dfrac{2}{5} \times 1\dfrac{3}{4}$.

9. Find $\dfrac{7}{8}$ of a kilogram.

10. Find $\dfrac{4}{5}$ of an hour.

11. Simplify : $\dfrac{12}{25} \times \dfrac{15}{28} \times \dfrac{35}{36}$.

12. By what number should $2\dfrac{3}{5}$ be multiplied to get $1\dfrac{6}{7}$?

13. A carton contains 16 boxes of nails and each box weighs $4\dfrac{3}{4}$ kg. How much would a carton of nails weigh?

14. Meena spends $\dfrac{4}{5}$ of her income on household expenses. Her monthly income is Rs. 15,000. How much does she save?

15. Divide $\dfrac{5}{9}$ by $\dfrac{2}{3}$.

16. Divide 45 by $1\dfrac{4}{5}$.

17. Solve : $5\dfrac{3}{7} \div 2\dfrac{5}{7}$.

18. Simplify : $3\dfrac{3}{7} \div \dfrac{8}{21} \times \dfrac{1}{27}$.

19. By what number should $6\dfrac{2}{9}$ be divided to obtain $4\dfrac{2}{3}$?

20. By what number should $6\dfrac{2}{9}$ be multiplied to get 40?

21. Convert 0.75 into a fraction.

22. Convert $\dfrac{17}{20}$ into a decimal.

23. Convert $\dfrac{25}{8}$ into a decimal.

24. Find the place value of 2 in 48.032.

25. How much less is 58 km than 98.6 km?

26. Multiply : 156.1 × 1000.

27. Multiply : 100.01 × 1.1.

28. Subtract 6.732 from 7.

29. By how much should 32.67 be increased to make it 40.00?

30. What should be added to 63.58 to get 90?

31. Rohit purchased a notebook for Rs. 13.65, a pencil for Rs. 2.00 and a pen for Rs. 14.35. How much did he pay in all?

32. Sapna bought a shirt for Rs. 125.50 and a jeans for Rs. 550.75. She paid Rs. 1000 in all. How much money did she get back?

33. Each side of a square is 2.5m in length. Find the perimeter of the square.

34. A vehicle covers a distance 48 km in 2.4 litres of petrol. How much distance will it cover in a litre of petrol?

35. Divide 432.8 by 1000.

36. Find the value : 30.94 ÷ 0.07.

37. Find the average of 4.2, 3.8 and 4.6.

38. Simplify : $11.2 \times 0.15 \div \dfrac{4}{5}$.

39. Simplify : 5.43 × 15 ÷ 5.

40. Simplify : 0.089 × 0.76 ÷ 0.19.

41. Total weight of some bags of wheat is 1743 kg. If each bag contains 49.8 kg. How many bags are there in all?

42. Shilpa cuts 25 metres of rope into pieces of 1.25 m each. How many pieces does she get?

43. The product of two decimals is 42.9870. If one of them is 12.46, find the other.

44. How many buckets of equal capacity can be filled from 850 litres of water, if each bucket has capacity of 8.5 litres?

45. Each side of a regular polygon of six sides is 3.5 cm in length. Find the perimeter of the polygon.

46. The product of two numbers is 2.56. If one of them is 1.6, find the other number.

47. Monika purchased 14.5 litres of refined oil for Rs. 290. Find the cost of one litre oil.

48. The cost of 20 pens is Rs. 298.80. Find the cost of one pen.

49. If the cost of a book is Rs. 75.50, find the cost of 50 such books.

50. If 1 kg of pure milk contains 0.245 kg of fat, how much fat is there in 100 kg of milk?

ANSWERS

1. $\dfrac{58}{63}$.

2. $\dfrac{59}{24}$.

3. 10

4. 1

5. $1\dfrac{2}{15}$.

6. $2\dfrac{1}{3}$ hrs.

7. 1/5

8. 15

9. 875 g

10. 48 min

11. $\dfrac{1}{4}$

12. $\dfrac{5}{7}$.

13. 76 kg

14. Rs. 3000

15. $\dfrac{5}{6}$.

16. 25

17. 2.

18. $\dfrac{1}{3}$.

19. $\dfrac{4}{3}$.

20. $\dfrac{45}{7}$.

21. $\dfrac{3}{4}$.

22. 0.85

23. 3.125

24. $\dfrac{2}{1000}$.

25. 40.6

26. 156100

27. 110.011

28. 0.268

29. 7.33

30. 26.42

31. Rs. 30

32. Rs. 323.75

33. 10m

34. 20 km

35. 0.4328

36. 442

37. 4.2

38. 2.1

39. 16.29

40. 0.356

41. 35 Bags.

42. 20 pieces

43. 3.45

44. 100 buckets

45. 21 cm

46. 1.6

47. Rs. 20

48. Rs. 14.94

49. Rs. 3775

50. 24.5 kg.

CHAPTER 3
DATA HANDLING

Points to Remember :

❏ Mean $= \dfrac{\text{Sum of the observations}}{\text{Number of observations}}$.

❏ Mode : The observation which occurs most frequently in a set of data is called Mode.

❏ Median : Median refers to the value which lies in the middle of the data (when arranged in increasing or decreasing order).

❏ Probability : The measure of the chance of something happening is called probability.

   ● The probability of happening an event may lie between 0 and 1.

   ● When an outcome is certain to happen, its probability is 1.

   ● When an outcome is impossible, its probability is 0.

QUESTIONS

1. Find mean of the first seven whole numbers.

2. Find mean of the first six natural numbers.

3. Calculate the mean of 2, 4, 6, 8, 10, 12, 14, 16.

4. Calculate the mean of first five multiple of 10.

5. The average marks scored by a student in five subjects is 72. Find his total marks.

6. The marks scored by a student in five subjects are 80, 75, 66, 51 and 91. How much should he score in the 6th subject to make his average score 75?

7. Find mean of the first five even numbers.

8. Find mean of the first six odd numbers.

9. Calculate the mean : 7.6, 4.8, 8.5, 6.4, 5.6, 3.5, 7.2, 4.4.

10. The age in years of 8 teachers of a school are 41, 28, 54, 35, 26, 33, 40, 39, find the mean.

11. What is the range of the following data : 46, 63, 25, 23, 39, 42, 21, 47, 68?

12. Calculate mean of the first five multiples of 3.

13. Calculate mean of the first five multiples of 5.

14. Find mean of the first five prime numbers.

15. The average runs scored by a cricketer in 6 innings is 55, find his total score.

16. Find the mean of 8, 12, 5, 6, 10, 7.

17. Find the range of the given data : 7, 18, 9, 24, 11, 45, 3, 16, 10, 2.

18. The mean of five numbers is 18. If one numbers is excluded, their mean is 16. What is the excluded number?

19. The mean of 8, 4, 5, x and 10 is 8. Find the value of x.

20. The mean of 4, 3, $x + 3$, 9, 10 is 7. Find the value of x.

21. The mean of 5 numbers is 28. If one number is excluded, their mean is 26. Find the excluded number.

22. If the mean of three observations, $x + 2$, $x + 4$, $x + 6$, is 15. Find x.

23. What is the class mark of the class 30 − 40?

24. What is the lower limit of the class 25 − 35?

25. What is the mean of first 5 multiples of 2?

26. Find the mode of the following data : 14, 9, 10, 14, 11, 12, 14, 13, 14, 11, 10, 14, 11.

27. Find the mode of the ages (in years) of 10 students of class VII.

    13, 12, 14, 12, 13, 12, 14, 12, 13, 14, 12.

28. The marks obtained by 6 students of a class 7th in a test are given below : 12, 15, 23, 23, 19, 21. Find the median.

29. Find the median from the following data written in ascending order :

    29, 41, 45, 63, 67, 69, 70.

30. Find the median : 6, 8, 9, 15, 21, 25, 28, 29.

31. Find the median of the data : 41, 43, 46, 48, 49, 52, 53, 55, 56.

32. Find the median of first 7 odd natural numbers.

33. Find the median of first 8 even natural numbers.

34. The ages in years of 9 teachers in a school are : 23, 34, 37, 39, 41, 42, 43, 45, 47. Find the median.

35. First the value of x if the mode of the following data is 7 : 5, 4, 7, 4, 7, x, 7, 4, 3, 5.

36. If 23 is taken out from the given data then what is the new median?

    20, 21, 22, 23, 24, 25, 26, 27.

37. What is the value of x if the median of given data is 18 : 15, 16, 17, $x + 2$, 19, 20, 21?

38. What is the new median, when 36 is added to the data : 32, 34, 36, 38, 40, 42, 44?

39. A dice is thrown once. What is the probability of getting 2?

40. If the probability of winning a game is 0.8, what is the probability of losing it?

41. A bag contains 5 red balls and 3 white balls. What is the probability that one ball drawn from the bag is white?

42. A dice is thrown at random. Find the probability of getting an even number.

43. A coin is tossed 100 times with the following frequencies :

    Head : 49, Tail : 51

    When a coin is tossed at random, what is the probability of getting Head?

Solve Q. 44–50 from Bar Graph

The bar graph given below represents the number of students studying in five different schools of a city. Study the bar graph and answer the following questions.
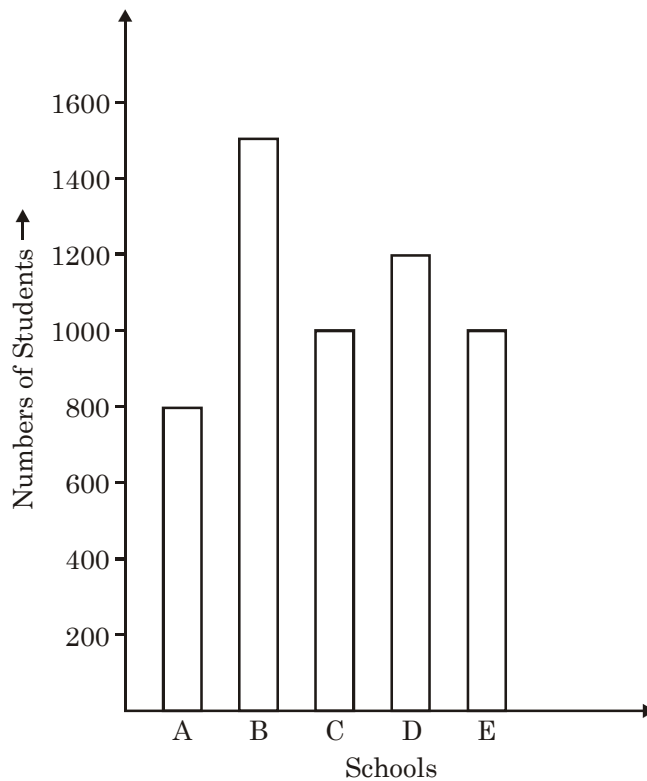
44. Which school has the minimum number of students in the above graph and how much?

45. Which school has the maximum number of students and how much?

46. How many schools are having students less than 1200?

47. Find the ratio of the number of students in schools *A* and *D*.

48. What is the difference between the number of students in schools B and C?

49. What is the sum of the number of students in schools A, C and E?

50. How many total students are there in all the schools?

ANSWERS

1.	3	2.	3.5
3.	9	4.	30
5.	360	6.	84
7.	6	8.	6
9.	6	10.	37 years
11.	47	12.	9
13.	15	14.	5.6
15.	330 runs	16.	8
17.	43	18.	26
19.	13	20.	6
21.	36	22.	11
23.	35	24.	25
25.	6	26.	14
27.	12 years	28.	23
29.	63	30.	18
31.	49	32.	7
33.	09	34.	41 years
35.	7	36.	24
37.	16	38.	37
39.	$\dfrac{1}{6}$.	40.	0.2
41.	$\dfrac{3}{8}$.	42.	$\dfrac{1}{2}$.
43.	$\dfrac{49}{100}$.	44.	A, 800.
45.	B, 1500	46.	3
47.	2 : 3	48.	500
49.	2800	50.	5500

CHAPTER 4

SIMPLE EQUATIONS

Points to Remember :

- ❑ An equation involving only a linear polynomial is called a linear equation. For example : $7x + 3 = 5$, $\frac{3}{2}x + 4 = \frac{1}{3}$ etc.

- ❑ An equation remains the same if the LHS and the RHS are interchanged.

- ❑ Changing terms of one side to other side is called transposing. While transposing a number, we change its sign. *e.g.,* $12p - 5 = 25$, $12p = 25 + 5$.

QUESTIONS

1. Change the given equations into statements

   (*i*) $3x + 5 = 27$ (*ii*) $7x = 49$

   (*iii*) $5x + 7 = 9$ (*iv*) $\frac{x}{3} + 5 = 8$

   (*v*) $\frac{3}{2}y + 7 = 29$.

2. Form equation for the following statements

   (*i*)   5 times a number is 25.

   (*ii*) One fourth of a number is 20.

   (*iii*) A number divided by 5 gives seven less than twice the number.

   (*iv*) 13 subtracted from three times a number is 8.

   (*v*)   The length of a rectangle is 8 meters more than its breath and its perimeter is 256 m.

3. Take any number. Multiply it by 3. Add 49 and divide the result by 7 then we get 7. Express this in the form of an equation.

   Solve the following equations and find the value of the variable :

4. $3x - 5 = 0$.   5. $\frac{5}{2}x = 10$.

6. $\dfrac{P}{4} + 7 = 5$.

7. $6z + 10 = -2$

8. $7 - 5x = 5 - 7x$

9. $2y + 3 = 5y + 7$

10. $5x - \dfrac{7}{3} = 3x - \dfrac{2}{3}$.

11. $\dfrac{3}{2}z - \dfrac{5}{3} = \dfrac{5}{3} + \dfrac{7}{2}z$.

12. $4y = \dfrac{2}{3}(3y - 7)$.

13. $\dfrac{2x - 3}{3} = 1 - \dfrac{2}{3}x$.

14. $5x + 3 = \dfrac{4}{3}(1 + x)$.

15. $\dfrac{5}{3}(2y - 1) = (3y - 5)$.

16. $\dfrac{2}{5}(2x - 1) = \dfrac{4}{5}(3x - 5)$.

17. $\dfrac{2y + 5}{3} = 3y - 8$.

18. $\dfrac{3x}{8} = 27$.

19. $\dfrac{y}{9} - \dfrac{y}{12} = \dfrac{1}{108}$.

20. $y - 2 = \dfrac{1}{5}(3y - 1)$.

21. $\dfrac{7P + 8}{9} = 9$.

22. $5x + 0.7 = 2.9$

23. $4x + 0.8 = 7.2$

24. $0.16(5x - 2) = 0.4(x + 1)$.

25. $2.8y = 54 + y$.

26. If $x = y + 2$, find the value of y from the equation $y - \dfrac{x - 2}{2} = \dfrac{2}{3}$.

27. If $x = y - 3$, find the value of y from the equation $y - \dfrac{x - y}{3} = \dfrac{4}{5}(y - x)$.

28. If $x = y - 2$ and $\dfrac{x}{y} - \dfrac{x + 1}{y} = 1$, find x and y.

29. Find 3 consecutive numbers whose sum is 45.

30. Find 3 odd consecutive numbers whose sum is 27.

31. If the smaller of two consecutive odd integers is doubled, the result is 7 more than the larger integer. Find the two integers.

32. Nine added to thrice a whole number gives 45, find the number.

33. Twice a number when decreased by 7 gives, 15 find the number.

34. A number is $\dfrac{2}{5}$ times another number. If their sum is 70, find the numbers.

35. A number when added to its half gives 72. Find the number.

36. A number is as much greater than 21 as it is less than 71. Find the number.

37. What is the number which when multiplied by 20 gives the product 120?

38. Find a number which when multiplied by 5 is increased by 80.

39. The sum of ages of father and son is 75 years. If the age of the son is 25 years, find the age of father.

40. Find the multiple of 8, if the sum of two consecutive multiples of 8 is 184.

41. If two complementary angles differ by 20°, find the measure of each angles.

42. Two supplementary angles differ by 40°. Find their measure.

43. The angles of a triangle are $(3x)°$; $(2x + 60)°$ and $(5x − 40)°$. Find each angle.

44. Find the measure of an angle, if its supplement measures 39° more than twice its complement.

45. When the smaller of two consecutive integers is added to three time the larger integer the result is 43. Find both the numbers.

46. If 2 is subtracted from a number, then tripled, the result is 4 more than the given number. Find the number.

47. The age of father is 30 years more than that of his son. 5 years hence father's age will be thrice of his son's age, find their present ages.

48. The numerator of a rational number is 7 less than the denominator. If the denominator is increased by 9 and the numerator is also increased by 2, we again get the same rational number. Determine the number.

49. The sum of present ages of Sameer and his father is 54 years. 6 years ago, his father was 6 times as old as his son. Find their present ages.

50. The combined cost of a T.V. and a fan is Rs. 13000. The cost of T.V. is 12 times the cost of the fan. Find the cost of each.

51. Umesh has three boxes of different fruits. A weighs 5 kg. more than box B and box C weighs 10 kg. more that box B. The total weight of three boxes is 48 kg. How many kg. does box A weighs?

52. After 12 years. Manoj will be 3 times as old as he was 4 yrs. ago. What is his present age?

53. The age of Nishant and Sanjay are in the ratio 4 : 5. Ten years hence the ratio of their ages will be 6 : 7. Find their present ages.

ANSWERS

1. (*i*) Adding 5 to the 3 times of a number give 27

   (*ii*) 7 times a number is 49.

   (*iii*) Adding 7 to five times of a number gives 9.

(*iv*)   Adding 5 to one third of x gives 8.

(*v*)   Adding 7 to $\dfrac{3}{2}$ of a number gives 29.

2.   (*i*) $5x = 25$ (*ii*) $\dfrac{y}{4} = 20$.

(*iii*) $\dfrac{x}{5} = 2x - 7$.   (*iv*) $3y - 13 = 8$.

(*v*) $2(2b + 8) = 256$.

3. $\dfrac{3x + 49}{7} = 7$.		4. $x = \dfrac{5}{3}$.	
5. $x = 4$.		6. $P = -8$.	
7. $z = -2$		8. $x = -1$.	
9. $y = \dfrac{-4}{3}$.		10. $x = \dfrac{5}{6}$.	
11. $z = -\dfrac{5}{3}$.		12. $y = \dfrac{-7}{3}$.	
13. $x = \dfrac{3}{2}$.		14. $x = \dfrac{-5}{11}$.	
15. $y = -10$.		16. $x = \dfrac{9}{4}$.	
17. $y = \dfrac{29}{7}$.		18. $x = 72$.	
19. $y = \dfrac{1}{3}$.		20. $y = \dfrac{9}{2}$.	
21. $P = \dfrac{73}{7}$.		22. $x = 0.44$	
23. $x = 1.6$		24. $x = 1.8$	
25. $y = 30$.		26. $y = \dfrac{4}{3}$.	
27. $y = \dfrac{7}{5}$.		28. $y = -1$; $x = -3$.	
29. 14, 15, 16.		30. 7, 9, 11.	
31. 9, 11.		32. $x = 12$.	
33. $x = 11$.		34. 20, 50	
35. 48		36. 46	

37.	6	38.	20
39.	50 years.	40.	88, 96.
41.	35°, 55°	42.	70°, 110°
43.	48°, 92°, 40°	44.	39°
45.	10, 11	46.	5.
47.	10 years; 40 years.	48.	$\dfrac{2}{9}$.

49. 12 years, 42 years

50. Rs. 1000 = cost of fan;   Rs. 12000 = cost of T.V.

51.	16 kg.	52.	12 years.

53. 20 years and 25 years.

CHAPTER 5

LINES AND ANGLES

Points to Remember :

❑   (*i*)   A line segment has two end points.

    (*ii*) A ray has only one end point.

    (*iii*) A line has no end points.

❑ When two lines meet at a point, they are called intersecting lines and when two lines do not meet even on extending, we call them Parallel lines.

❑ Vertically opposite angles formed by two intersecting lines are equal.

❑ Complementary angles : Two angles whose sum is 90°.

   Supplementary angles : Two angles whose sum is 180°.

❑ Adjacent angles : Two angles are called adjacent angles if they have

   (*i*) a common vertex (*ii*) a common arm (*iii*) Non common arms are on either side of common arm.

❑ When a transversal intersects two parallel lines then :

   (*a*)   Each pair of corresponding angles are equal.

   (*b*)   Each pair of alternate interior angles are equal.

   (*c*)   Interior angles on the same side of the transversal are supplementary.

QUESTIONS

1. In the given Fig. *i.e.,* $\angle 1 = 50°$ then find $\angle 2, \angle 3, \angle 4$.
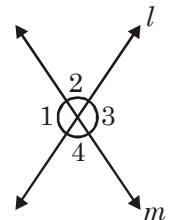
2. Find complement of the following angles :

   (*a*) 20°   (*b*) 66°   (*c*) 40°   (*d*) 35°

3. Find supplement of the following angles.

   (*a*)   105°   (*b*)   87°   (*c*)   154°

4. Identify which of the following pair of angles are complementary and which are supplementary :

   (*a*)   63°, 117°   (*b*)   23°, 67°   (*c*) 105°, 75°   (*d*) 120°, 60°.

5. Two supplementary angles are in the ratio 3 : 7, find the angles.

6. Two complementary angle are in the ratio 2 : 3, find the angles.

7. Find the angle which is half of its complementary angle.

8. Find the angle which is one third of its supplementry angle.

9. Find the angle which is equal to its supplement.

10. Two angles of a linear pair are in the ratio 2 : 7, find the angles.

11. Find the angle which is equal to its complement.

12. An angle is greater than 30° than its complement. What the measurement of complementary angles?

13. An angle is equal to 5 times its complement. Determine its measure.

14. An angle is equal to 8 times its supplement. Determine its measure.

15. An angle is greater than 60° than its supplementary angle. What is the supplementary angle?

16. Determine the value of *x*, *y* and *z* in the following figure.
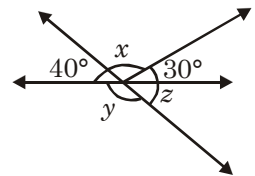
17. If $l \parallel m$ and $\angle 2 = 58°$ find $\angle 1$.
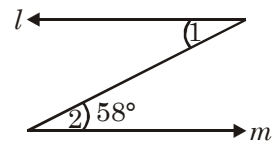
18. $l \parallel m$ and *t* is a transversal, find *x*.
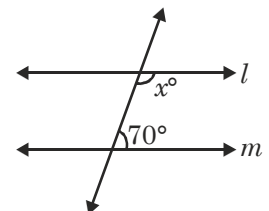
19. If $l \parallel m$ and t is a transversal, find x.
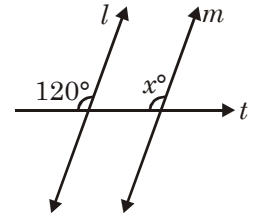
20. If $l \parallel m$ and $\angle 1 = 57°$, then find $\angle 2$, $\angle 3$ and $\angle 4$.
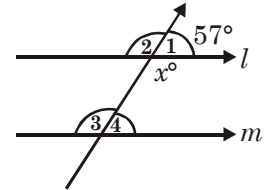
21. Find the value of x if $l \parallel m$.
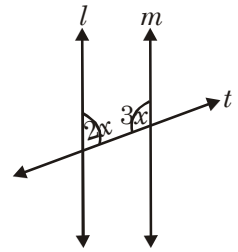
22. Find value of y and z if $l \parallel m$.
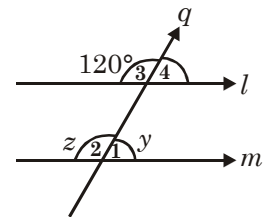
23. If $l \parallel m$, find x.
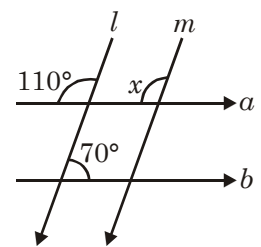
24. If $p \parallel q$ and l is a transversal, find x.
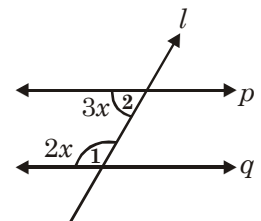
25. In the given fig $AB\|ED$ and $BC\|EF$. If $\angle ABC = 62°$, find $\angle x$, $\angle y$ and $\angle z$.
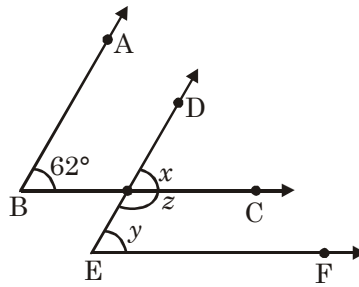
26. If $l\|m$ find x, y, z, u, v, t and w.
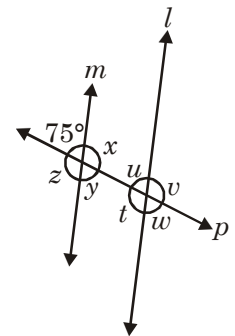
27. In the given fig $l\|m$ find value of $a, b, c\ d, e, f$
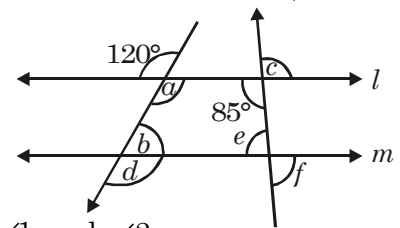
28. In fig. $l\|m$ If $\angle 1$ and $\angle 2$ are in the ratio 2 : 3, find $\angle 1$ and $\angle 2$.
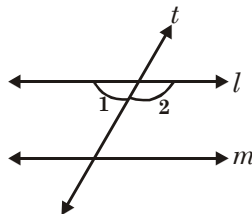
29. If $m\|n$ and p and q are transversal.
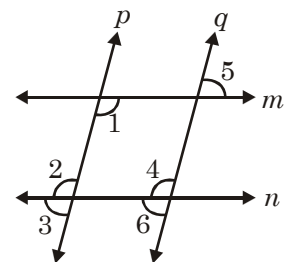
    $\angle 1 = 123°$, find $\angle 2$, $\angle 3$. Also if $\angle 4 = 85°$ and $\angle 5$ and $\angle 6$.

30. The difference of the measures of two complementry angles is 40°. Find the measures of the angles.

31. The difference in the measure of two supplementry angles is 80°, find the measures of the angles.

32. Find the pair of supplementary angles in the figure.

(i)

(ii)

(iii)

(iv)
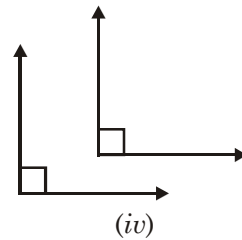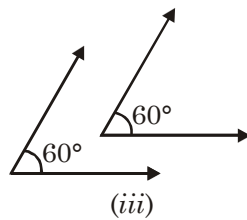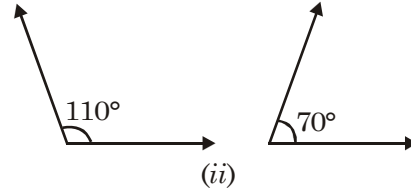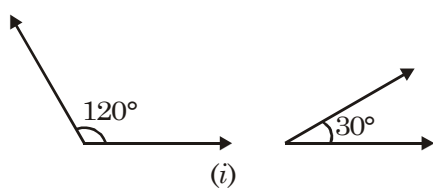
33. Find x if $l \parallel m$.

34. Two complementry angles are in the ratio 4 : 5, find the greater angle.

35. Find the angle which is 9 times of its supplementry angle.

36. Two angles of a linear pairs are in the ratio 1 : 5 find angles.

37. Two supplementry angles are in the ratio 2 : 3, find the smallest angle.

38. An angle is 20° greater than its complementry angle. What is the complementry angle.

39. An angle is equal to 3 times of its supplement. Determine its measure.

40. An angle is equal to double of its complement. Determine its measure.

41. Find value of x, if $l \parallel m$.
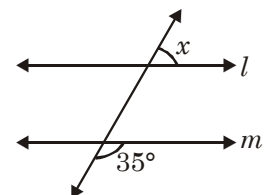
42. If $a \| b$ and P is a transversal find $\angle 1$ and $\angle 2$.
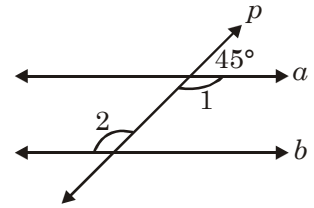
43. If $l \| m$ and P is a transversal, find $\angle 1$.
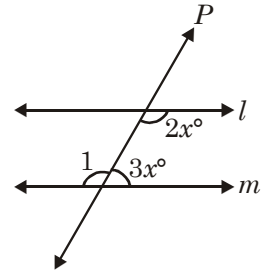
44. If $l \| m \| n$ and q is a transversal, then find $\angle 1$.
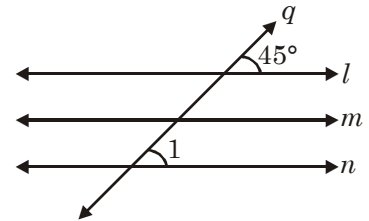
45. Find the angle which is $\dfrac{1}{5}$ th of its complementry angle.

46. An angle is greater then $25°$ than its complement. What is its complementary angle?

47. An angle is greater than $80°$ than its supplement. What is its supplementary angle.

48. If $l \| m$ and P is a transversal, find x.
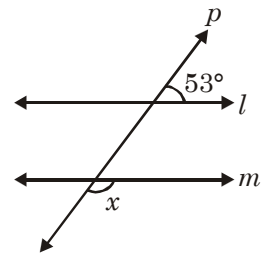
49. Find the angle which is $\dfrac{1}{9}$ th of its supplementary angle.

50. From the figure, find x, y, z.
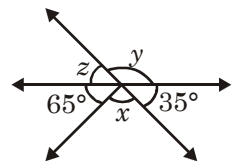
ANSWERS

1. $\angle 2 = 130°$, $\angle 3 = 50°$, $\angle 4 = 130°$

2. (*a*) 70°   (*b*) = 24°   (*c*) 50°   (*d*) = 55°

3. $a = 75°$; $b = 93°$; $c = 26°$.

4. Complementry = b, Supplementry = a, c, d

5. 54°, 126°

6. 36°, 54°

7. 30°

8. 45°

9. 90°

10. 40°, 140°

11. 45°

12. 60°, 30°

13. 15°, 75°

14. 20°, 160°

15. 60°

16. $x = 110°$, $y = 140°$, $z = 40°$

17. $\angle 1 = 58°$

18. 110°

19. 120°

20. $\angle 2 = 123°$, $\angle 4 = 57°$, $\angle 3 = 123°$

21. $\angle 1 = 135°$, $\angle 2 = 45°$

22. $\angle y = 60°$, $\angle z = 120°$

23. $x = 110°$

24. $x = 36°$

25. $\angle x = 62°$, $\angle y = 62°$, $\angle z = 118°$

26. $\angle x = 105°$, $\angle y = 75°$, $\angle z = 105°$, $\angle u = 75°$, $\angle v = 105°$, $\angle t = 105$, $\angle w = 75°$

27. $a = 120°$, $b = 60°$, $c = 85°$, $d = 120°$, $e = 95°$, $f = 95°$

28. 72°, 108°

29. $\angle 2 = 123°$, $\angle 3 = 57°$, $\angle 5 = 95°$, $\angle 6 = 95°$.

30. 25°, 65°.

31. 50°, 130°

32. (*ii*), (*iv*)

33. $x = 75°$

34. 50°

35. 162°

36. 30°, 150°

37. 72°

38. 35°

39. 135°

40. 60°

41. 145°

42. $\angle 1 = \angle 2 = 135°$

43. 72°

44. $\angle 1 = 45°$

45. 15°

46. 57.5°

47. 130°

48. 127°

49. 18°

50. $x = 80°$, $y = 145°$, $z = 35°$.

RAPID FIRE ROUND

1. What is the complementary angle of 25°?

2. What is supplementary angle of 135°?

3. If two lines intersect each other and $\angle 1$ and $\angle 2$ are vertically opposite angles. If $\angle 1 = 70°$ find $\angle 2$.

4. An angle is $\dfrac{4}{5}$ of its complement. Find the angle.

5. An angle is $\dfrac{2}{3}$ of its supplement. Find the angle.

6. Find the supplement of a right angle.

7. An angle is equal to its complement, what is its magnitude?

8. An angle is equal to its supplement, what is its magnitude?

9. What is the supplement of an acute angle?

10. An angle is greater than 45°, what is its complementry angle?

ANSWERS

1.	65°	2.	45°
3.	70°	4.	40°
5.	72°	6.	90°
7.	45°	8.	90°
9.	obtuse angle.	10.	Less than 45°

CHAPTER 6

TRIANGLES AND PROPERTIES

Points to Remember :

- ❏ A closed figure of three line segments is called trignale.
- ❏ Area inside the triangular region is called interior region of the triangle.
- ❏ There are three vertices, three sides and three angles in a triangle.
- ❏ Sum of angles of a triangle is 180°.
- ❏ Exterior angle of a triangle is equal to sum of two interior opposite angles.

QUESTIONS

1. What are the points that lie on the given triangle?
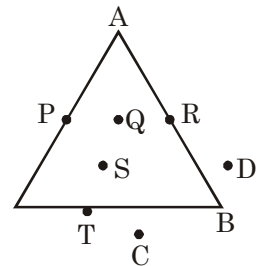
2. What are the points that lie in the triangular region?
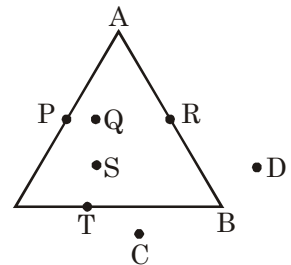
3. Which sides are equal in ΔPQR?
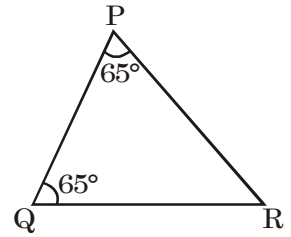
4. Which angles are equal in ΔLMN?
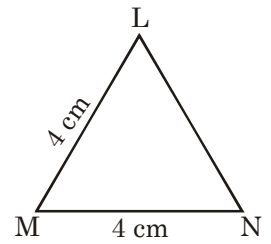
5. In the given triangle, find the value of *x*.
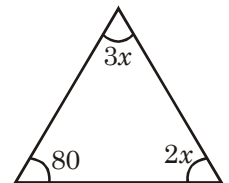
6. In the given figure find the value of *x*.
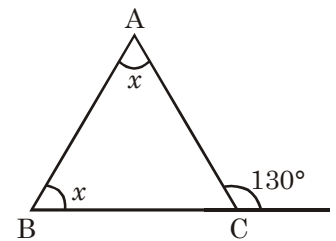
7. Angles of a triangle are in the ratio 8 : 12 : 16. Find the angles.

8. Find angles ∠CAD and ∠BCD in the given figure.
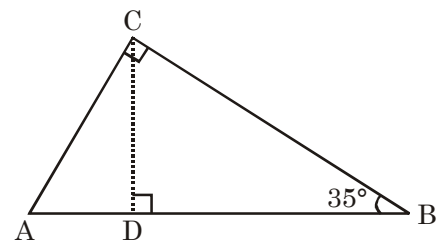
9. In $\triangle ABC$, $DE||BC$. Find x, y and z.
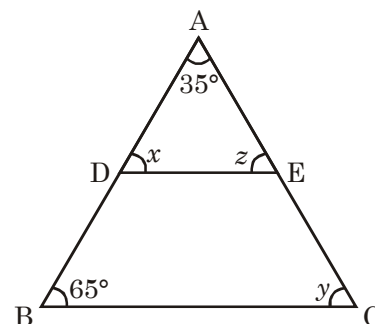
10. Two angles of a triangle are equal and third angle is smaller than others by 15°. Find the angles.

11. Three angles of a triangle are $x - 10°$, $x + 20°$, $2x - 30°$. Find each angle.

12. Find x and y in the given figure.
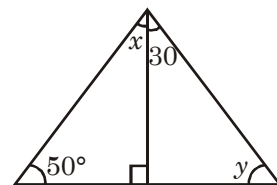
13. Find value of x and y in the given figure.
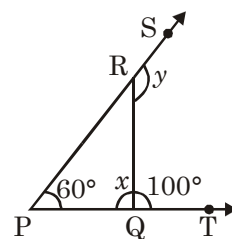
14. Find x in the given figure.
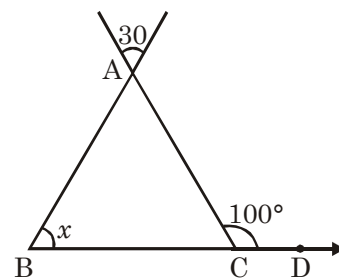
15. Find the ∠*BAC* in the given figure.
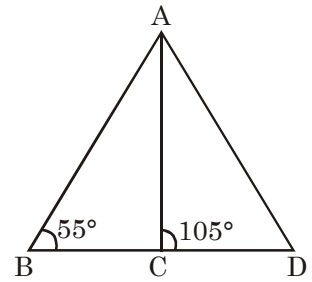
16. Find ∠*ACB* in the given figure.
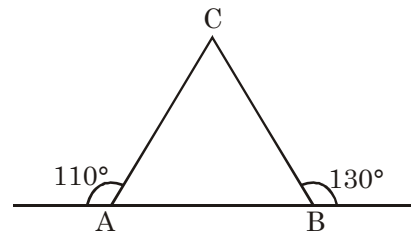
17. Two sides of a triangle are 11 cm and 5.5 cm. What will be the minimum length of the third side?

18. Which side is the smallest side of the triangle *ABC*?
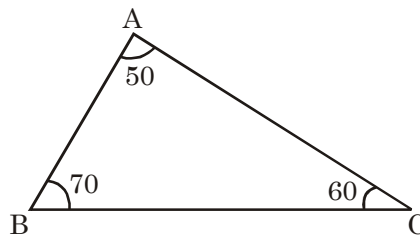
19. What is the location of the point of concurrence of altitudes in an obtuse angled triangle? What is this point of concurrence called?

20. What is the position of the point-of concurrence of all the medians in a right-angled triangle.

21. What is the value of x and y in the given figure?
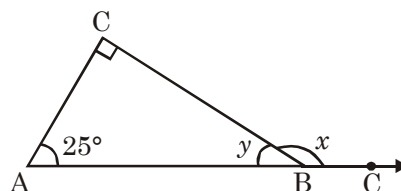
22. Find the value of x and y in the given figure.
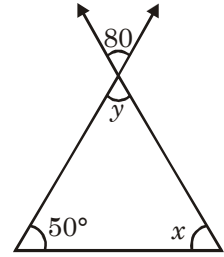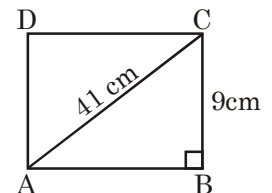
23. Find the value of x.
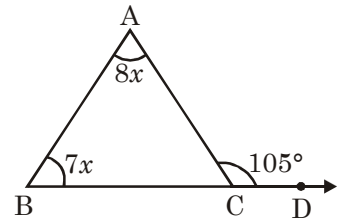
24. Two sides of a triangle are 10cm and 15 cm. What will be the maximum length of third side?

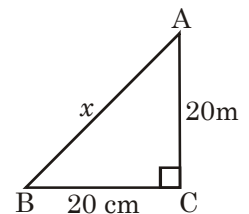25. Find the value of x in the given figure?
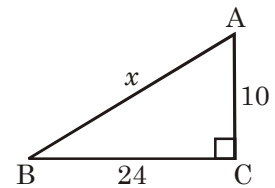
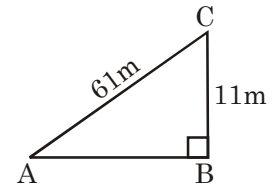26. Find the perimeter of the given rectangle.

27. Diagonals of a rhombus are 6cm and 8cm. What will be the perimeter of such rhombus?

28. A ladder 25m long reaches a window of a building 20m above the ground. Find the distance between foot of the ladder and building.
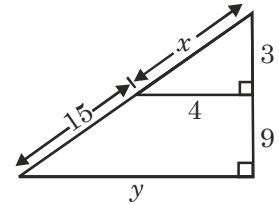
29. Find the value of x.

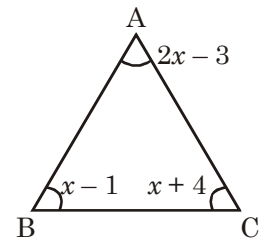30. A man goes 15m due west and then 8 m due north. How far is he from the starting point?
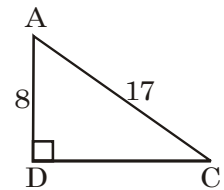
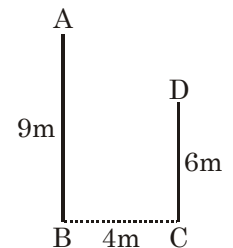31. Find the length of AB in the given figure?

32. Find the value of x and y.

33. Find $\angle A$, $\angle B$ and $\angle C$.
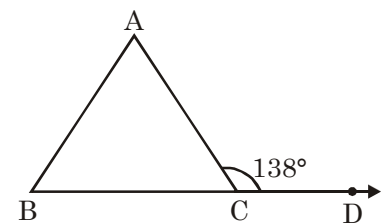
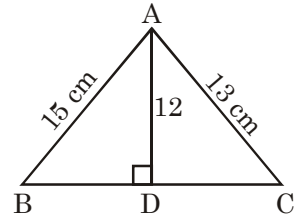34. Find the length of DC.

35. Find the distance from A to D.

36. Length of a diagonal of a square is $18\sqrt{2}$m. Find the perimeter of the square.
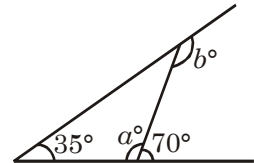
37. In the given figure $AC = BC$. Find $\angle ABC$.
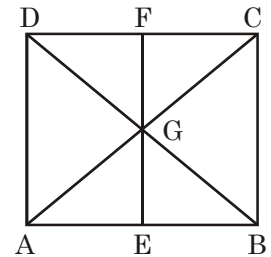
38. Find the length of *BC* in the given figure.

39. In the given figure find the value of *a* and *b*.

40. Find out from the given sides of a triangle which will form a right-angled triangle?

    (*a*) 15, 10.25;   (*b*) 27, 36, 39;   (*c*) 15, 36, 39   (*d*) 7, 24, 25

41. How many triangles are there in the given figure?

42. In an equilateral triangle, altitudes are drawn. Name the point where altitudes of the triangle meet.

43. In the given figure *AB = AC*. *OB* and *OC* are the angle bisectors of ∠*B* and ∠*C*. Find ∠*ABC*, ∠*ACB* and ∠*BAC*.
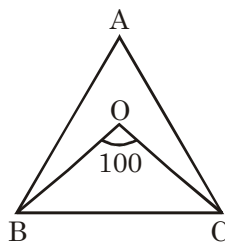
44. Triangle *ABC* is an isosceles right triangle. Find all the angles of the triangle.

45. A man goes 30 m due east and then 40 m due north. Find his distance from the starting point.

46. A boy is flying a kite with 100 m long thread. The perpendicular height of the kite distance between the boy and the point from which the height of kite is measured.

47. Find ∠*BAC*, and ∠*ACB*.
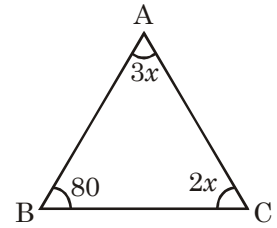
48. Length and breadth of a rectangle are 24 cm and 10 cm. Find its diagonal.

49.   (*i*)   Incentre of an obtuse-angled triangle lies in .... of triangle.

    (*ii*)   Orthocentre of an obtuse-angled triangle lies in .... of triangle.

    (*iii*)   Median of an obtuse-angled triangle lies in .... of triangle.
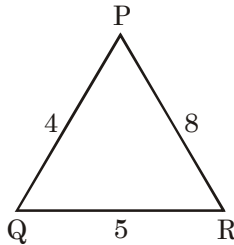
    (*iv*)   Perpendicular bisectors of the sides of a triangle meet at ....

50. In the given Δ*PQR,* which angle will be the greatest and which will be the smallest?

51. In an isosceles Δ*ABC*, *AB* = *AC* and ∠*B* = 4∠*A*. Find the angles of the triangle.

ANSWERS

1.	P, T, R.	2.	*Q, S*
3.	*PR, QR*	4.	∠*L* and ∠*N*.
5.	*x* = 20°	6.	*x* = 65°
7.	40, 60, 80	8.	55°, 55°
9.	65°, 80°, 80°	10.	65, 65, 50
11.	40, 70, 70	12.	*x* = 40, *y* = 60
13.	*x* = 80, *y* = 140	14.	70°
15.	50°	16.	60°
17.	More than 5.5 cm	18.	*BC*
19.	Orthocentre outside the Δ	20.	Inside the Δ
21.	*x* = 115°, *y* = 65°	22.	*x* = 50°, *y* = 80°
23.	*x* = 7	24.	Less than 25

25.	$x = 26$	26.	98
27.	20 cm	28.	15 m
29.	√800	30.	17 m
31.	60 m	32.	$x = 5$, $y = 16$
33.	87, 44, 49	34.	15
35.	5	36.	72
37.	69	38.	14
39.	110, 145	40.	(*d*)
41.	12	42.	orthocentre
43.	80°, 80°, 20°	44.	90, 45, 45
45.	50 m	46.	60 m
47.	60°, 40°	48.	26 cm

49. (*i*) Exterior (*ii*) Exterior, (*iii*) Interior, (*iv*) circumcentre

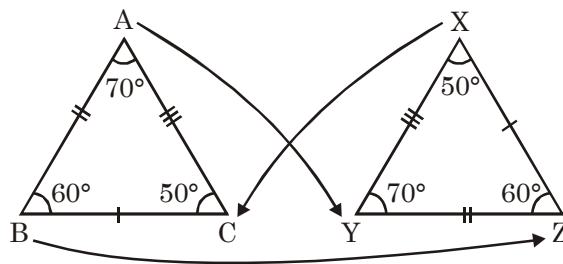50. ∠*R* smaller, ∠*Q* greater. 51. 20, 80, 80.

CHAPTER 7

CONGRUENCE OF TRIANGLES

Points to Remember :

If $\triangle ABC \cong \triangle PQR$, their corresponding parts are equal. Thus, $AB = PQ$, $BC = QR$, $CA = RP$, $\angle A = \angle P$, $\angle B = \angle Q$ and $\angle C = \angle R$.

Observe the corresponence of the vertices in the following figure :

Example : Correspondence of vertices :

| Correspondence of sides : |

           A $\longleftrightarrow$ Y   AB $\longleftrightarrow$ YZ

           B $\longleftrightarrow$ Z   BC $\longleftrightarrow$ ZX

           C $\longleftrightarrow$ X   AC $\longleftrightarrow$ YX

$\therefore$ $\triangle ABC \cong \triangle YZX$.

QUESTIONS

1. When are two geometric figures said to be congruent?

2. When are two line segments said to be congruent?

3. When are two angles said to be congruent?

4. When are two squares said to be congruent?

5. Two rectangles are congruent if _____.

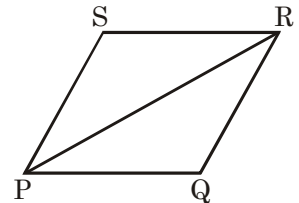6. Two circles are congruent if _____.

---

7. If $m\angle ABC = m\angle LMN$ then $\angle ABC$ _____ $\angle LMN$.

8. When are two triangles said to be congruent?

9. ΔABC is an equilateral triangle. Is $\Delta ABC \cong \Delta ACB$? If yes, state the three criteria of congruence.

10. In the figure, $ABCD$ is a rectangle. AC is a diagonal
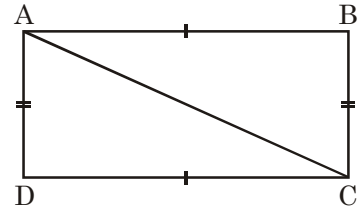
   (i) Is $\Delta ACD \cong \Delta CAB$.   (ii) What congruence condition is used?

11. In the figure, $PQRS$ is a rhombus.


   (i) Is $\Delta PQR \cong \Delta RSP$?   (ii) What congruence condition is used.

[Choose true or false and correct the wrong statements : (fron Q. 12 to Q. 17).

12. Two triangles are congruent if three sides of one triangle are respectively equal to the three sides of the other trignale.

13. Congruent figures cover each other completely?

14. Congruent figures are same in shape.

15. Congruent figures are equal in size.

16. If two sides and the included angle of one triangle are respectively equal to any two sides and the included angle of the other then the two triangles are congruent.

17. In the figure measure of sides and angles of ΔPQR and ΔLMN are given. Which of the statements are true?

(i) $\Delta LMN \cong \Delta PQR$ (ii) $\Delta LMN \cong \Delta QPR$ (iii) $\Delta LMN \cong \Delta QRP$
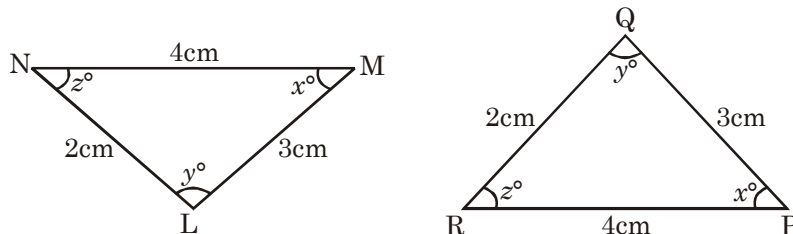
18. Are the given figures congruent? Give reasons.
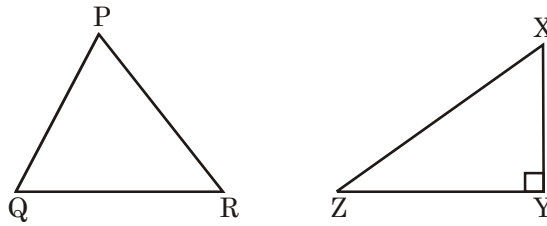
19. If $\triangle PQR \cong \triangle XYZ$ then

   (i) $\angle P =$ _____   (ii) _____ $= \angle Z$ (iii) $PQ =$ _____   (iv) ___ $= XZ$
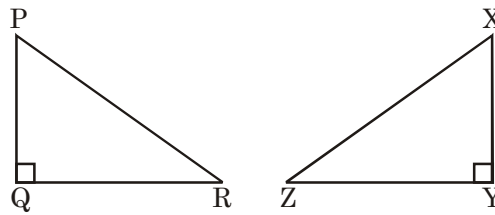
20. From the measure of following triangles, find the corresponding sides and corresponding angles.
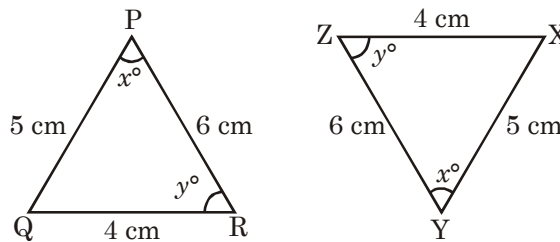
21. On the basis of the measurements of following triangles, find the corresponding sides and corresponding angles.
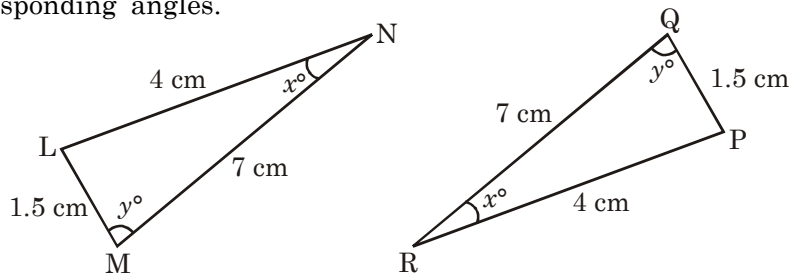
22. If $\triangle AOB \cong \triangle DOC$ then what is the measure of $\angle ODC$ and $\angle OCD$?
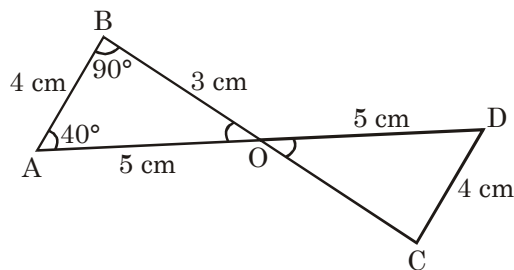
23. If $\triangle ABC \cong \triangle PRQ$ then from the appropriate correspondence find the side QR. Also find $\angle Q$ and $\angle R$.
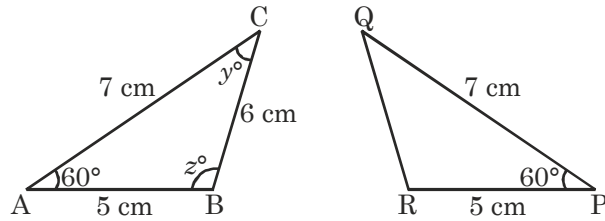
24. In the given figure which of the two triangles are congruent with appropriate correspondence.
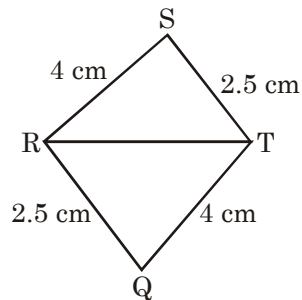
25. In the given figure which of the two triangles are congruent with appropriate correspondence.
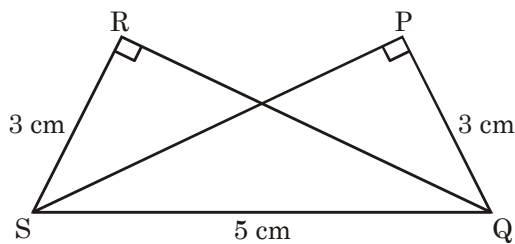
26. In the figure of Q. 25 which criterion is suitable to prove the congruence of the two triangles?

27. In Q. 26 in the congruence of triangles, which of the sides and angles are equal?

28. Are the following triangles congruent? If yes, then give the congruence criterion.
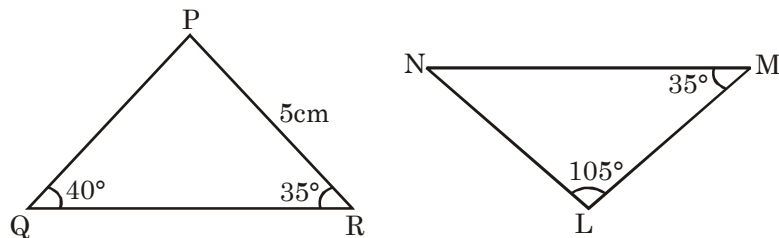
29. In Q. 28 if the triangles are congruent then name them according to the correspondence. Also name the pairs of corresponding angles.

30. In the given figure, ΔDEF is an isosceles triangle in which $DE = DF$ and DL is the median of the triangle. Is $\Delta DEL \cong \Delta DFL$? Also give reasons.
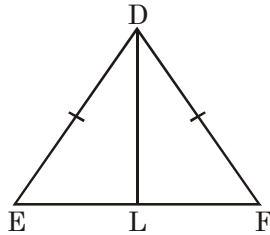
31. In the given figure, ΔPQR is an equilateral triangle and PM is the perpendicular on the side QR. Name the different criteria which are applicable to prove the congruence of ΔPQM and ΔPRM ? Why ?
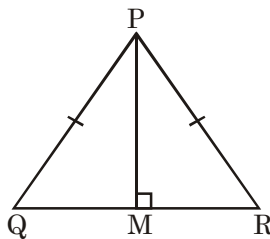
32. Which other pair of sides should be equal to make the given triangles congruent?
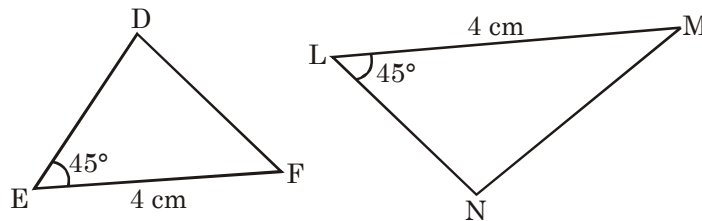
33. Which other pair of the angles should be equal to make the following triangles congruent?
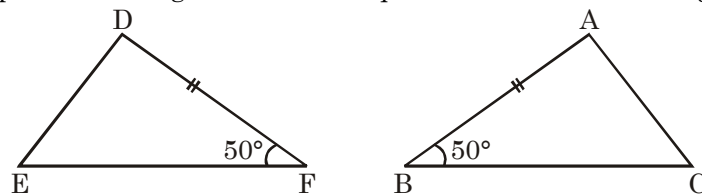
34. In the following pair of triangles which other pair sides is should be equal for the given triangles to be congruenct according to the *SAS* congruence criterion?
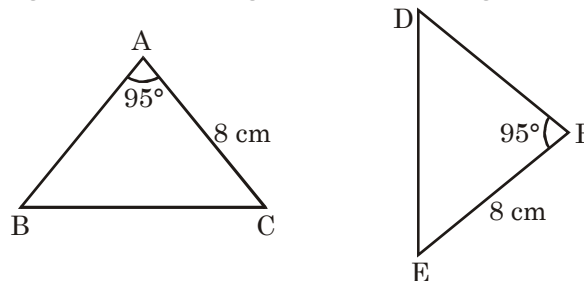
35. In $\triangle PQR$, which is the including angle of PQ and PR?
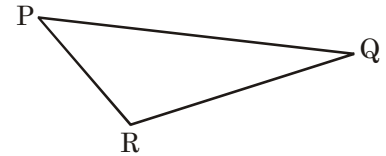
36. In $\triangle DEF$, which is the including side of $\angle EDF$ and $\angle DEF$?
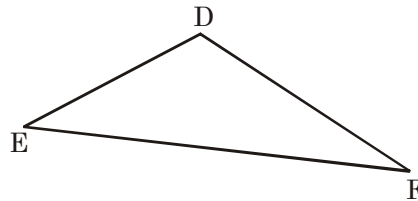
37. In $\triangle ABC$ which is the including angle of side AB and BC?
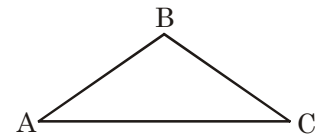
38. In the figure $\triangle ABC$ and $\triangle ABD$ are two triangles in which $AD = BC$ and $AC = BD$. Name the corresponding triangles.
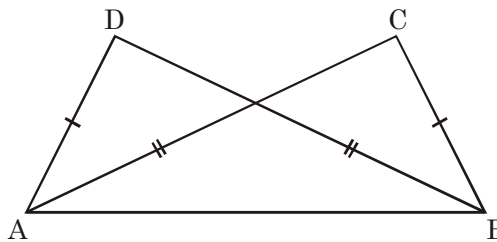
39. If $\triangle ABC \cong \triangle LMN$, name the corresponding sides and the corresponding angles.

40. If $\triangle PQR \cong \triangle XYZ$, name the corresponding sides and the corresponding angles.

41. If $\triangle LMN \cong \triangle RST$, name the corresponding sides and the corresponding angles.

42. Which of the triangles are congruent and according to which congruence criterion? Name the corresponding sides.
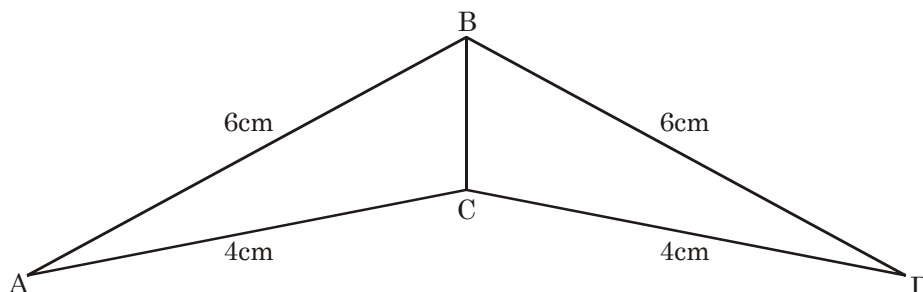
43. Name the congruent triangles (in the given figure) according to the side-side side (SSS) rule. Also name the corresponding equal sides.
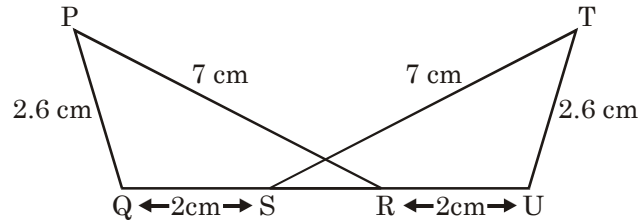
44. In the following figure, P bisects the two line segments AB and CD.

    (i)   Is $\triangle APC \cong \triangle BPD$?   (ii)   Is $AC \parallel BD$?
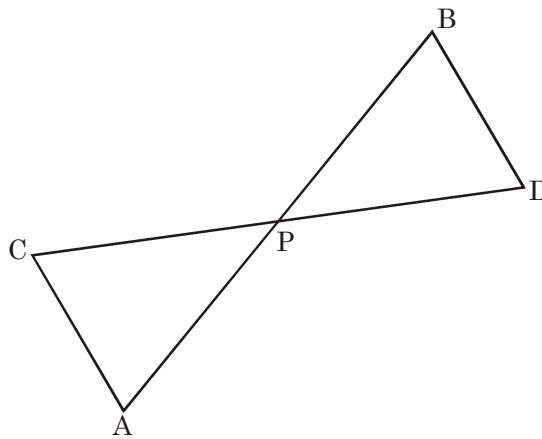
45. If $\triangle PQR \cong \triangle MNL$

    (i)   Which side of $\triangle PQR$ is equal to the side of LM of $\triangle MNL$?

    (ii)   Which angle of $\triangle MNR$ is equal to $\angle R$ in the $\triangle PQR$.

46. In the following figure, if S is the mid point of the side QR, then is $\triangle PQS \cong \triangle PRS$? Also give reasons.
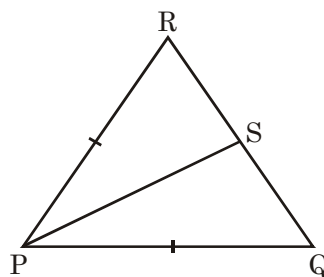
47. In the figure given below $\triangle ABC$ and $\triangle DEF$ are such that $AB = DE$, $BC = EF$, Extend CB and FE to L and M such that $\angle ABL = \angle DEM$. Is $\triangle ABC \cong \triangle DEF$? Give reasons.
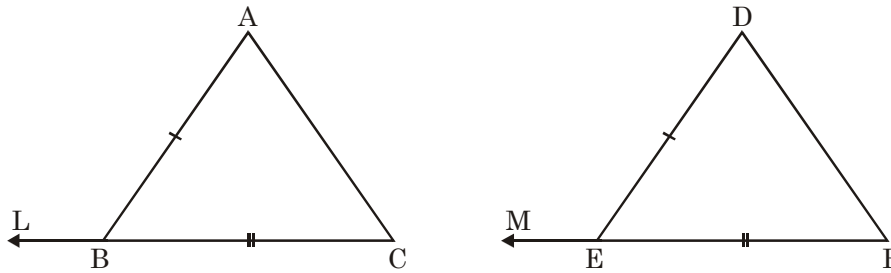
48. In the following figure, $AB = AC$ and $BL = CM$. Is $AL = AM$? Also give reasons.
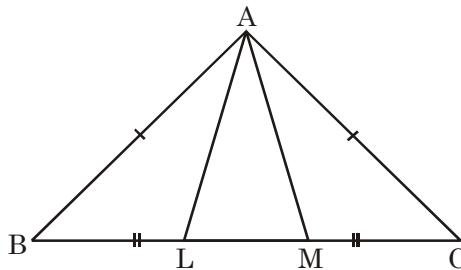
49. In the following figure, $PQ = LM$, $PL = RN$ and $\angle QPR = \angle MLN$. Is $\triangle PQR \cong \triangle LMN$? Give reasons.
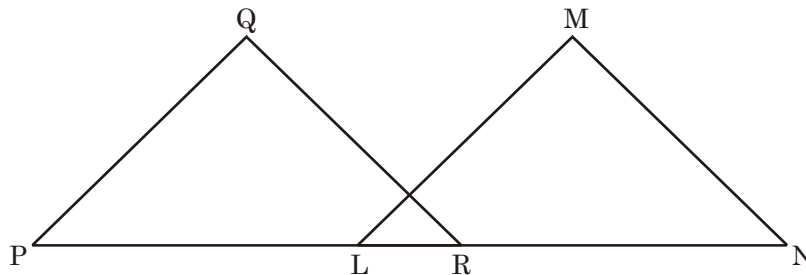
50. In the following figure, $PL \perp AB$ and $PM \perp AC$, $PL = PM$. Does AP bisect $\angle BAC$? Give answer with reasons.
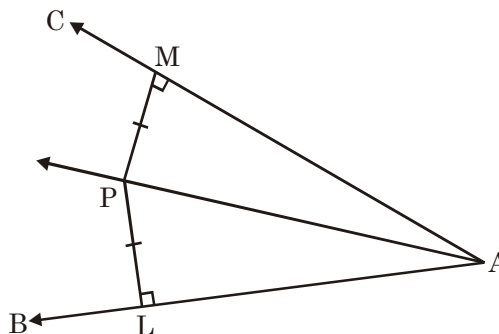
ANSWERS

1. Two geometric figures are said to be congruent if they have the same shape and size.

2. Two line segments are congruent if they have the same length.

3. Two angles are said to be congruent if they have the same measure and shape.

4. Two squares are said to be congruent if they have the same side length.

5. They have the same length and breadth.

6. They have the same radii.

7. $\angle ABC \cong \angle LMN$.

8. Two triangles are congruent if and only if one of then can be made to superimpose on the other, so as to cover the other exactly.

9. Yes, S.A.S., S.S.S., A.S.A. or A.A.S.

10. Yes, SSS congruence condition.

11. Yes, SSS congruence condition.

12. True

13. True

14. False, congruent figures are equal in shape and size.

15. False, congruent figures are equal in shape and size.

16. True.

17. (*ii*) $\Delta LMN \cong \Delta QPR$.

18. No, the given figures are not congruent because they are not equal in shape and size.

19. Yes, $\Delta PQR \cong \Delta XYZ$.

  (*i*) $\angle P = \angle X$ (*ii*) $\angle R = \angle Z$

  (*iii*) $PQ = XY$ (*iv*) $PR = XZ$

20. $\angle P = \angle Y, \angle Q = \angle X$

 $\angle R = \angle Z$

 $PQ = YX$

 $PR = YZ$

 $RQ = ZX$

21. $\angle N = \angle R$

 $\angle M = \angle Q, \angle L = \angle P$

$NM = RQ$

$NL = RP$

$LM = PQ$

22. $\angle ODC = 40°$; $\angle OCD = 90°$.

23. $QR = 6$ cm

$\angle Q = y°$; $\angle R = z°$

24. $\Delta SRT \cong \Delta QTR$ (SSS rule)

25. $\Delta RSQ \cong \Delta PQS$, RHS

26. RHS

27. $\angle R = \angle P = 90°$

$RS = PQ$ $SQ = QS$

28. Yes, angle-side-angle (ASA)

29. $\Delta PRQ \cong \Delta LMN$, $\angle P = 105° = \angle L$, $\angle R = \angle M = 35°$

30. Yes, $\Delta DEL \cong \Delta DFL$, S.S.S. congruence criterion $DE = DF$, $EL = LF$, $DL = DL$.

31. S.S.S., A.S.A., S.A.S., R.H.S. because in an equilateral triangle perpendicular bisectors, median, angle bisector coincides.

32. $DE = NL$

33. $\angle A = \angle D$

34. $AB = FD$

35. $\angle P$

36. DE

37. $\angle B$

38. $\Delta ADB \cong \Delta BCA$

39. $AB = LM$, $BC = MN$, $AC = LN$, $\angle A = \angle L$, $\angle B = \angle M$, $\angle C = \angle N$.

40. $PQ = XY$, $QR = YQ$, $PR = XZ$, $\angle P = \angle X$, $\angle Q = \angle Y$, $\angle R = \angle Z$.

41. $LM = RS$, $MN = ST$, $LN = RT$, $\angle L = \angle R$, $\angle M = \angle S$, $\angle N = \angle T$.

42. $\Delta BCA \cong \Delta BCD$ S.S.S.; $AB = DB$, $AC = DC$, $BC = BC$.

43. $\Delta PQR \cong \Delta TUS$; $PQ = TU$, $PR = TS$, $QR = US$

44. (i)   Yes, S.A.S. congruence criterion; $PC = PD$, $PB = PA$, $\angle APC = \angle BPD$ (Vertically opposite angles).

(*ii*) Yes; $\angle CAP = \angle DBP$ (Corresponding angles of congruent triangle but they are also alternate angle).

∴ $AC \parallel BD$.

45. (*i*) RP (*ii*) $\angle L$

46. Yes; $PQ = PR$, $PS = PS$, $RS = QS \Rightarrow$ S.S.S. Congruency criterion.

47. Yes; S.A.S.; $AB = DE$, $BC = EF$, $\angle ABC = \angle DEF$

48. Yes, $\triangle ABL \cong \triangle ACM$ (SAS)

∴ $AL = AM(cpct)$

49. Yes; S.A.S; $QP = ML$, $\angle QPR = \angle MLN$, $PR = LN$.

50. Yes; $\triangle AMP \cong \triangle ALP$ [R.H.S. congruence)

$\angle MAP = \angle LAP$ (Corresponding parts of congruent triangles).

∴ AP divides $\angle BAC$.

CHAPTER 8
COMPARING QUANTITIES

Points to Remember :

1. A ratio is a fraction.

2. A ratio is always in the simplest form.

3. Four numbers *a, b, c, d* are in proportion if *a* : *b* :: *c* : *d* or *a* × *d* = *b* × *c*.

4. Fraction can be converted into percentage and vice-versa.

5. The price at which we buy the goods is called its Cost Price (CP).

6. The price at which goods are sold is called its Selling Price (SP).

7. If SP > CP then there is a profit and SP – CP = Profit.

8. IF SP < CP then there is a loss and CP – SP = Loss.

9. Gain % = $\dfrac{\text{Gain}}{\text{CP}} \times 100$, Loss % = $\dfrac{\text{Loss}}{\text{CP}} \times 100$

10. Amount = Principal + Interest

11. Simple Interest = $\dfrac{\text{P} \times \text{R} \times \text{T}}{100}$.

QUESTIONS

1. Find the ratio in the simplest form :
    (*i*) 3 kg to 12 kg
    (*ii*) 80 paise to Rs. 2
    (*iii*) 12.8 m to 3.2 m.

2. Ram bought 5 kg potatoes and Vineet bought 3 kg 500 g potatoes. Find the ratio of Ram's and Vineet's potatoes.

3. A school has 800 students. There are 500 girls and remaining are boys. Find the ratio of boys and girls.

4. Amit's salary is Rs. 42000 p.m. and he pays Rs. 6000 as income tax every month. Find the ratio of his income to the income tax.

5. The length of a ribbon is 10 m and its width is 25 cm. Find the ratio of width to the length.

6. Express the following ratios into the simplest form :

   (*a*)   15 : 18   (*b*)   32 : 40   (*c*)   108 : 12

7. Find equivalent ratio for each of the following :

   (*a*)   2 : 5   (*b*)   4 : 9

8. The first three terms of a proportion are 2, 3, and 6. Find the fourth term.

9. If $3 : x : : 9 : 15$, find x.

10. Out of 400 oranges, 80 oranges are found rotten. Find the ratio of rotten oranges to good oranges.

11. Which ratio is greater :

    (*i*)   15 : 18 or 24 : 27?

    (*ii*)   15 : 27 or 32 : 40?

12. Find the cost of 10 pencils, if cost of 6 pencils is Rs. 72.

13. 6 kg. of rice is enough for 20 people. How much rice is required for 100 people?

14. Bananas are available in the market at the rate of Rs. 24 per dozen. Find the cost of 10 bananas.

15. Convert the following fractions into percent :

    (*a*) $\dfrac{12}{16}$ (*b*) $\dfrac{49}{60}$ (*c*) $\dfrac{4}{4}$

16. Convert the following percentage into decimals :

    (*a*)   10.2%   (*b*)   40%   (*c*)   0.07%

17. Express the following percentage as fraction in its lowest form :

    (*a*)   75%   (*b*)   20%   (*c*)   6%

18. If 75 percent of students in a class like to play hockey, what percentage of students do not like to play hockey?

19. In a fruit basket, 50% are apples, 25% are oranges and remaining are bananas. Find the % of bananas.

20. A shop has 500 bulbs out of which 10 are defective. What percent of bulbs are defective?

21. Find :

    (*a*)   50% of 175   (*b*)   75% of Rs. 120   (*c*)   25% of 64 kg.

22. 75% of x = 15. Find x.

23. Ram saves Rs. 500 from his salary. If this is 25% of his salary, what is his salary?

24. What percent of Rs. 150 is Rs. 30?

25. What percent of 4 km is 160 gm.

26. Express the following as percent :

   (*a*)   3:15   (*b*)   4 : 5   (*c*)   15 : 40

27. If the angles of a triangle are in the ratio 1 : 2 : 3, find the value of each angle.

28. A school team won 7 games this year against 5 games won last year. What is the percent increase?

29. Ram buys an old house for Rs. 3,00,000. He spends Rs. 20% of the cost price on its repairs and sells it for Rs. 4,50,000. Find his gain or loss percent.

30. An electronics dealer buys a radio for Rs. 225 and spends Rs. 15 on transporting it to his shop. If he sells the radio for Rs. 300. Find his profit percent.

31. Ram buys a coloured TV for Rs. 10,000 and sells it for Rs. 12,000. Find his gain %.

32. Shyam Lal sold a horse for Rs. 1560 and gained 4%. Find the cost price.

33. A man sold a watch at Rs. 3,800 and lost 5%. What was the cost price?

34. The selling price of an article is $\dfrac{4}{5}$ of its cost price. Find the loss percent.

35. The cost price of 4 articles is the same as the selling price of 3 articles. Find the profit percent.

36. Find the simple interest on Rs. 400 for $3\dfrac{1}{3}$ years at 3% p.a.

37. Find interest and amount when Principal = Rs. 1000, Rate = 5% p.a., Time = 3 years.

38. Find interest and amount when Principal = Rs. 200, Rate = 12% p.a., Time = 6 months.

39. Find simple interest on the sum of Rs. 800 for 2.5 years at 4.5% p.a.

40. At what rate percent per annum will Rs. 800 amount to Rs. 1000 in 5 years?

41. Calculate the time if Principal = Rs. 2500, Simple Interest = Rs. 625, Rate of Interest = 5% p.a.

42. Calculate the rate of interest if Principal = Rs. 5000, S.I. = Rs. 700, Time = 2 years.

43. Rs. 600 are invested at 5% simple interest p.a. In how much time will it double itself ?

44. At what rate percent per annum will Rs. 800 amount to Rs. 1000 in one year?

45. In what time will Rs. 2,700 will double itself if rate of interest is 4% p.a?

46. Chalk contains calcium, carbon and oxygen in the ratio of 10 : 3 : 12. Find the percentage of carbon in chalk.

47. Ram purchased a radio set for Rs. 400 and sold it to Shyam at a profit of 25%. Shyam sold it to Mohan at a loss of 10%. For how much money did Mohan buy it?

48. There are 13 boys and 12 girls in the class. What is the percentage of girls in the class?

49. Kapil bought a sofa set for Rs. 4500 and sold it for Rs. 4,200. Find his loss percent.

50. A farmer bought a cow for Rs. 12,000 and sold it at a gain of 10%. Find the S.P. of the cow.

ANSWERS

1. (*i*) 1 : 4 (*ii*) 2 : 5 (*iii*) 4 : 1   2.   10 : 7

3. 3 : 5   4.   7 : 1

5. 1 : 40   6.   (*a*) 5 : 6 (*b*) 4 : 5 (*c*) 9 : 1

7. (*a*) 4 : 10 (*b*) 8 : 18   8.   9

9. 5   10.   1 : 4

11. (*i*) 24 : 27 (*ii*) 32 : 40   12.   Rs. 120

13. 30 kg   14.   Rs. 20

15. (*a*) = 75% (*b*) = 98% (*c*) = 100%   16.   (*a*) = 0.102% (*b*) = 0.40 (*c*) 0.0007

17. (*a*) = $\frac{3}{4}$ (*b*) = $\frac{1}{5}$ (*c*) = $\frac{3}{50}$ 18.   25%

19. 25%   20.   2%

21. (*a*) 87.5 (*b*) Rs. 90 (*c*) 16 kg.   22. $x = 20$

23. Rs. 2000   24.   20%

25. 4%   26.   (*a*) = 20% (*b*) = 80% (*c*) = 37½%

27. 30º, 60º, 90º   28.   40%

29. Gain 25%   30.   25%

31. 20%   32.   Rs. 1500

33. Rs. 4000   34.   20%

35. $33\frac{1}{3}$%   36.   Rs. 40

37. I = Rs. 150, A = Rs. 1150.   38.   I = Rs. 12; A = Rs. 212

39. Rs. 90   40.   5%

41. 5 years   42.   7% p.a.

43. 20 years   44.   25%

45.	25 years	46.	12%
47.	Rs. 450	48.	48%
49.	$6\frac{2}{3}\%$	50.	Rs. 13,200

RAPID FIRE

1. The ratio of 2 minute to 1 hour is _____.

2. The present population of a town is 50,000. If the population increases 5% then what is the population after 1 year?

3. If 25% of x is 500, find x.

4. $x\%$ of y is ....

5. 0.75 is equal to what percent?

6. $\dfrac{1}{3}$ as percent is equal to ....

7. Rita scored 90% marks in Maths out of 500. What marks did Rita scored?

8. What is SI for Rs. 1000, if rate % = 5% p.a. and time 2 years?

9. Ram purchases an article for Rs. 1000 and sold it at Rs. 800. Find his loss %.

10. Find the Principal if SI = Rs. 100, Time = 2 years, Rate = 5% p.a.

ANSWERS

1. 1 : 30
2. 52500
3. 2000
4. $xy/100$
5. 75%
6. $33\frac{1}{3}\%$
7. 450 marks
8. Rs. 100
9. 20% loss
10. Rs. 1000

CHAPTER 9
RATIONAL NUMBERS

❑ A number written in the form of $\dfrac{p}{q}$ where $q \neq 0$.

e.g., $\dfrac{1}{2}$, $\dfrac{3}{7}$, $\dfrac{-5}{8}$, $\dfrac{-13}{15}$, $\dfrac{17}{-19}$

❑ The number zero is neither a positive nor a negative rational numbers.

❑ Rational numbers are classified as positive and negative rational numbers.

❑ All integers and fractions are Rational numbers.

QUESTIONS

1. Find a rational number whose numerator is $(20 - 15)$ and denominator is $[2 \times (-3)]$.

2. Find a rational number whose numerator is $(35 - 15)$ and denominator is $[3 \times (-7)]$.

3. Convert $\dfrac{-4}{5}$ into a rational number whose numerator is 24.

4. Express $\dfrac{-6}{-7}$ as a rational number whose denominator is -42.

5. Express $\dfrac{-5}{-9}$ as a rational number whose denominator is 45.

6. Express $\dfrac{27}{-45}$ in the standard form.

7. Express $\dfrac{64}{128}$ in the simplest form.

8. Express $\dfrac{-25}{-115}$ in the standard form.

9. Express $\dfrac{-77}{22}$ in the lowest form.

10. Express $\dfrac{-8}{28}$ in the standard form.

11. Express $\dfrac{-12}{-30}$ in the simplest form.

12. Find any two equivalent numbers of $\dfrac{-10}{17}$.

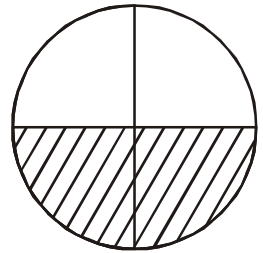13. Find two equivalent numbers

$$\dfrac{-4}{-9} = \dfrac{\square}{18} = \dfrac{12}{\square}$$

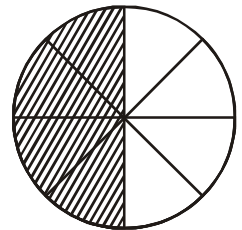14. Find two equivalent numbers

$$\dfrac{6}{-13} = \dfrac{-12}{\square} = \dfrac{24}{\square}$$

15. Find two equivalent numbers of $\dfrac{7}{-15}$.
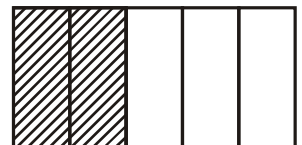
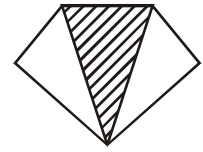16. Express the figure given as a rational number.

17. Express the figure given as a rational number.

18. Express the shaded portion in the form of fraction.

19. Express the shaded portion in the given figure as a rational number.

20. How many rational numbers are there between any two rational numbers?

21. Which one is greater 3/4 or 5/4.

22. What is the product of a number and its multiplicative inverse.

23. Calculate $\dfrac{4}{9} + \dfrac{9}{4}$.

24. Tell the rational number whose additive inverse is –7.

25. Simplify : $\dfrac{-3}{4} + \dfrac{5}{9}$

26. Simplify : $\dfrac{-8}{19} + \left(\dfrac{-2}{57} \right)$

27. Simplify : $\dfrac{5}{6} + \left(-\dfrac{5}{9} \right)$

28. Find the value of : $\dfrac{13}{5} - \dfrac{12}{25}$

29. Find the value of : $\dfrac{-6}{13} - \left(\dfrac{-7}{13} \right)$

30. Find the value of : $\dfrac{5}{63} - \left(\dfrac{-8}{21} \right)$

31. Simplify : $\dfrac{2}{3} + \dfrac{3}{4} + \dfrac{1}{12}$

32. The sum of two rational numbers is $\dfrac{11}{5}$. If one of them is $\dfrac{-4}{15}$, find the other rational number.

33. The sum of two rational numbers is –8. If one of the numbers is $\dfrac{-15}{7}$, find the other number.

34. What number should be added to $\dfrac{-5}{11}$ so as to get $\dfrac{26}{33}$?

35. Pawan gives $\dfrac{1}{5}$th part of his monthly income in charity and deposits $\dfrac{1}{6}$th part in the bank. He spends the remaining amount. What part of his salary does he spend?

36. Give the additive inverse of $\dfrac{4}{5} + \dfrac{1}{5}$.

37. Give the additive inverse of $\dfrac{6}{7} - \dfrac{2}{7}$.

38. What number should be subtracted from $\dfrac{-7}{8}$ to get $\dfrac{5}{9}$?

39. Subtract $\dfrac{4}{5}$ from $\dfrac{5}{4}$.

40. Multiply $\left(\dfrac{-2}{9}\right)$ by $\dfrac{33}{54}$.

41. Multiply $\left(\dfrac{-3}{7}\right)$ by $\dfrac{7}{5}$.

42. Multiply $\left(\dfrac{9}{-11}\right)$ by $\left(\dfrac{22}{-27}\right)$

43. Simplify and express the result as a rational number in standard form : $\left(\dfrac{-14}{9}\right) \times (-27)$

44. The product of two rational numbers is $\dfrac{-7}{9}$. If one of the numbers is $\dfrac{-4}{9}$, find the other number.

45. Simplify : $\dfrac{56}{25} \div \dfrac{(-7)}{50}$

46. Express the number $\dfrac{1}{2} + \dfrac{1}{5}$ as a decimal.

47. Find the multiplicate inverse of $\dfrac{3}{11} + \dfrac{5}{9}$.

48. Find the reciprocal of $\dfrac{-7}{26} + \left(\dfrac{-11}{39}\right)$

49. A man travels a distance of $\dfrac{13}{11}$ km by car and $\dfrac{9}{11}$ km by bus to reach his destination. How much distance did he travell in all?

50. A child walks $\dfrac{7}{24}$ km towards north and then $\dfrac{17}{36}$ km towards south. How far is the child now from the starting point?

ANSWERS

1. $\dfrac{-5}{6}$

2. $\dfrac{-20}{21}$

3. $\dfrac{24}{-30}$

4. $\dfrac{-36}{-42}$

5. $\dfrac{25}{45}$

6. $\dfrac{-3}{5}$

7. $\dfrac{1}{2}$

8. $\dfrac{5}{23}$

9. $\dfrac{-7}{2}$

10. $\dfrac{-2}{7}$

11. $\dfrac{2}{5}$

12. $\dfrac{-20}{34}$, $\dfrac{-30}{51}$

13. 8, 27

14. 26, −52

15. $\dfrac{14}{-30}$, $\dfrac{-49}{105}$

16. $\dfrac{2}{4}$

17. $\dfrac{4}{8}$

18. $\dfrac{2}{5}$

19. $\dfrac{1}{3}$

20. infinite.

21. $\dfrac{5}{4}$

22. 1

23. $\dfrac{117}{36}$

24. 7

25. $\dfrac{-7}{36}$

26. $\dfrac{-26}{57}$

27. $\dfrac{5}{18}$

28. $\dfrac{53}{25}$

29. $\dfrac{1}{13}$

30. $\dfrac{29}{63}$

31. $\dfrac{3}{2}$

32. $\dfrac{37}{15}$

33. $\dfrac{-41}{7}$

34. $\dfrac{41}{33}$

35. $\dfrac{19}{30}$ th part

36. −1

37. $\dfrac{-4}{7}$

38. $\dfrac{-103}{72}$

39. $\dfrac{9}{20}$

40. $\dfrac{-11}{81}$

41. $\dfrac{-3}{5}$

42. $\dfrac{2}{3}$

43. 42

44. $\dfrac{7}{4}$

45. −16

46. 0.7

47. $\dfrac{99}{82}$

48. $\dfrac{-78}{43}$

49. 2 km

50. $\dfrac{13}{72}$

CHAPTER 10

PRACTICAL GEOMETRY

Points to Remember :

1. Recall that :

    (*i*) A triangle is constructed if sum of the lengths of two line-segments is greater than the third.

    (*ii*) If the sum of three given angles is 180°, these may be the angles of a triangle.

    (*iii*) Minimum number of elements required to construct a triangle are three because three vertices have to be located. We can recall these elements by using indirectly the concept of congruence of triangles *i.e.*

    (*a*) SSS (Three sides are known)

    (*b*) SAS (Two sides and included angle is known)

    (*c*) ASA (Two angles and included side is known)

    (*d*) RHS (Hypotenuse of right angled triangle and length of one side is known)

Line Parallel to a Given Line

(*i*) We can draw many lines parallel to a given line.

(*ii*) Through a point given outside a line, we can draw only one line parallel to the given line.

QUESTIONS

1. The lengths of the three line segments are 4 cm, 5 cm, and 6 cm. Can a triangle be constructed with these?

2. The lengths of the three line segments are 3 cm, 4 cm, 8 cm. Is it possible to construct a triangle?

3. Is it possible to construct a triangle with the triplet of three line segments 2 cm, 4 cm and 6 cm?

4. What should be the relation between the three sides of a triangle to construct a triangle?

5. What should be the sum of three angles so that a triangle can be constructed?

6. How many minimum number of elements are required to construct a triangle? Why?

Q. 7 to Q. 10 – Fill in the Blanks

7. The length of _____ sides may be enough to construct a triangle.

8. _____ sides and the _____ angle are enough to construct a triangle.

9. _____ angles and the _____ side are enough to construct a triangle.

10. _____ side and length of _____ is enough to construct a right angled triangle.

11. Give a triplet of lengths using which triangle can be constructed?

12. Which geometrical instrument can be used to draw an arc?

13. If three sides measure 5.2 cm, 4 cm, 6 cm then what type of triangle can be constructed?

14. If $\angle R = 50°$, $\angle S = 70°$ and $RS = 5.5$ cm then what type of triangle can be constructed?

15. If length of a side and length of hypotenuse is given then what type of triangle can be constructed?

16. How many lines can be drawn parallel to a given line?

17. How many lines can be drawn parallel to a given line and through a point outside the given line?

ANSWERS

1. Yes 2. No

3. No

4. Sum of the lengths of any two sides of a triangles is greater than the third side.

5. 180°

6. Three, because three vertices have to be located

7. Three 8. Two, included

9. Two, included 10. One, Hypotenuse

11. Any triplet which satisfies the condition that sum of the lengths of any two sides of a triangle is greater than the third side.

12. Compass 13. Scalene

14. Scalene Acute Angled Triangle 15. Right Angled Triangle

16. Many lines 17. Only one line

CHAPTER 11
PERIMETER AND AREA

**Points to Remember :**

1. Perimeter of a Rectangle = 2 (length + breadth)

2. Perimeter of a Square = 4 × side

3. Area of Rectangle = length × breadth

4. Area of Square = (side)^2

5. Area of Parallelogram = base × corresponding height

6. Area of Triangle = ½ × base × corresponding height

7. Area of Circle = πr^2

8. Circumferance of Circle = $2\pi r$

QUESTIONS

1. One of the sides and the corresponding height of a parallelogram are 5 cm and 3 cm respectively. Find the area of the parallelogram.

2. In a triangle, if one side is 7 cm and its corresponding height is 4 cm, find its area.

3. If area of ΔABC is 49 cm^2 and its height AD is 7 cm, find BC.

4. If area of a parallelogram is 17.6 m^2 and its base is 4 cm, find its corresponding height.

5. Find the breadth of a rectangular plot if its area is 440 cm^2 and length is 22 cm. Also find its perimeter.

6. The perimeter of a rectangular sheet is 100 cm. If the length is 35 cm, find its breadth.

7. The length and breadth of a rectangular plot are in the ratio of 4 : 3. If the perimeter is 140 cm, find its area.

8. The length and breadth of a rectangular park are in ratio 9 : 5. If its perimeter is 280m, find its area.

9. What is the circumferance of a circle whose diameter is 49 m?

10. What is the circumference of a circle whose radius is 14 cm?

11. The radius of a circle is 7 cm. The circle is divided into two equal parts. What is the perimeter of each semi circular part?

12. Find the area of a circle if its radius is 7 cm.

13. The diameter of a circle is 28 cm. Find its area.

14. If the circumferance of a circular sheet is 154 cm, find its diameter.

15. Find the circumference of a wheel whose radius is 21 cm. Also find the distance covered by it in 10 revolutions.

16. If the ratio of the diameter of two circles is 2 : 5, find the ratio of their circumferences.

17. The diameter of a car's tyre is 70 cm. Find the distance covered by it in 5 revolutions.

18. The circumference of a circle is 31.4 cm. Find its radius.

19. If the area of a circle is 154 cm^2, find its radius.

20. A person starts walking around a square field and in reaching back to the starting place he travels 3496 m. Find the side of the square field.

21. Calculate the breadth of the rectangle whose length and breadth are in the ratio 5 : 7 and perimeter is 120 m.

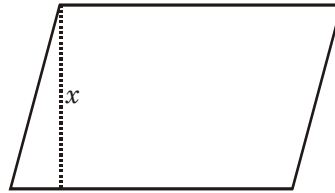22. In rectangle *ABCD, AC* is a diagonal, length = 8 cm and breadth = 5 cm. Find the area of triangle *ABC*.
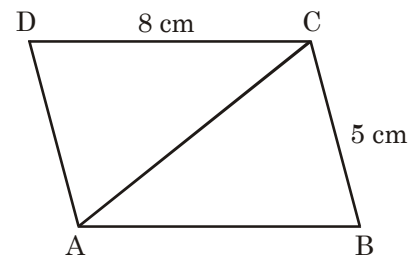
23. PQRS is a square and it is divided into four triangles as shown below. If a side of the square is 7 cm, find the area of each triangle.
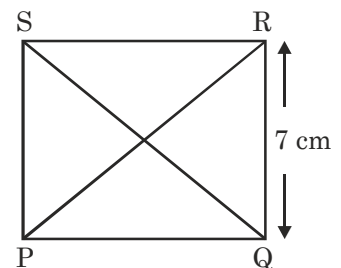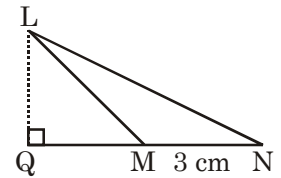
24. Find the area of the parallelograms shown below.

(i)

(ii)
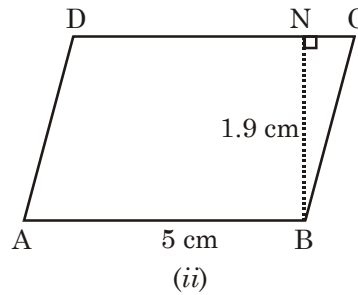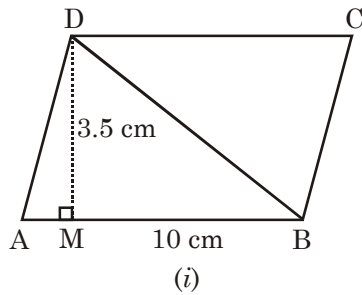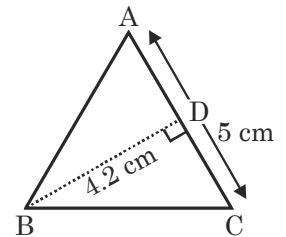
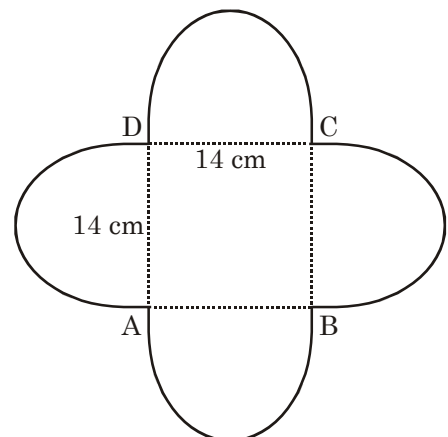25. Find the height x if the area of the parallelogram is 96 cm^2 and its base is 6 cm.

26. Find the area of the given ΔLMN if LQ = 2 cm.


27. Find the area of given ΔABC.

28. Find the perimeter of the given shape.

29. A piece of wire is 40 cm long. It is bent in the form of a square. Find its side.

30. A horse is tied with a rope in the centre of a square field of side 30 m. If the length of the rope is 14 m. Find the area of the field where horse cannot graze?

31. The given figure represents a rectangular field with a square flower bed in the middle. Find the area of the lawn excluding the area of the flowerbed.

A   B

3 m   5 m

D   10 m   C
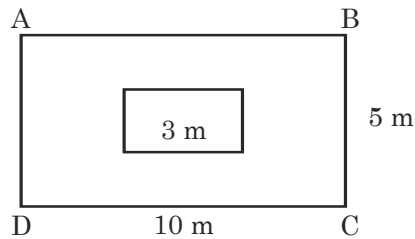
32. From a circular card of radius 7 cm, a rectangular sheet of dimension 2 cm × 1 cm is removed. (See the given figure). Find the area of the remaining card.

7 cm

1 cm

2 cm
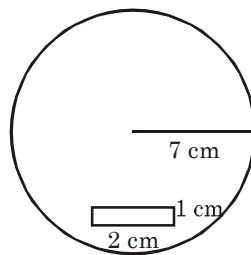
33. Find area of the shaded portion.

D   C

14 m

A   14 m   B
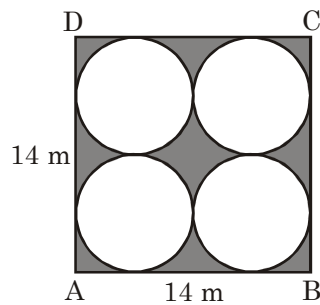
34. Find the perimeter of the given figure, which is a semicircle including its diameter.

14 cm

35. From a rectangular piece, a triangular portion is removed as shown in the Fig. Find the remaining area.
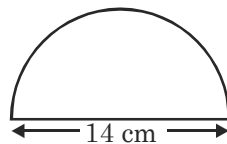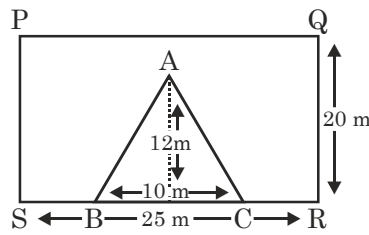

36. Find the width of the rectangle in the following figure if length of the wire is same for triangle and rectangle both.
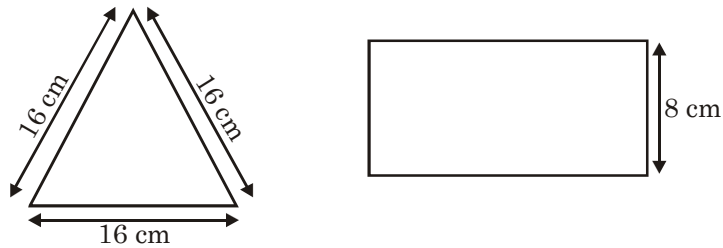
37. A park is in the shape of rectangle as shown. Square flower beds are made at each corner. Find the area of the flowerbeds.
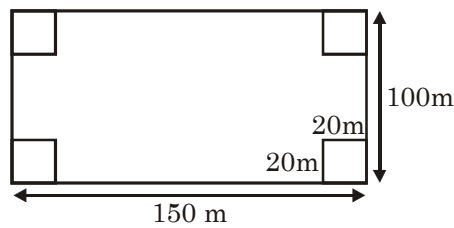
38. Chess Board is to be made as shown below. Find the side of each small square.
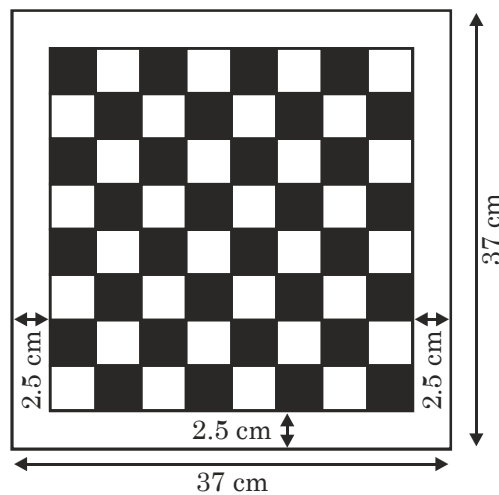
39. For a Home Science practical, 200 students were given cloth pieces of size 20 cm × 25 cm. Find the total cost of cloth @ Rs. 50 per m².

40. Two squares are made of wire as shown. Find the side of the square whose area is equal to the sum of the areas of these two squares.

6m

8m
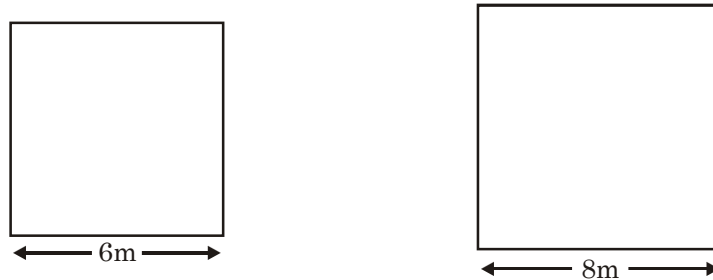
41. Calculate the side of the square whose area is equal to the sum of the areas of these two rectangles.

20cm

50cm

30cm

50cm
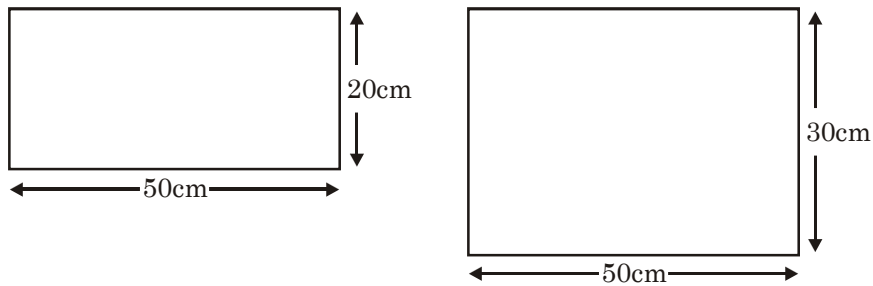
42. Out of a rectangular sheet of paper, a strip is cut (as shown in the figure given below). Find the area of the remaining portion.

20cm

2.5 cm

2.5 cm

25cm
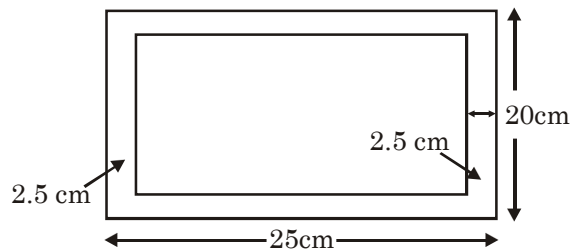
43. For making a paper bag, a rectangle 15 cm × 10 cm is required. Find the cost of 10 paper bags if cost of paper is Rs. 2 per cm² and labour cost is Rs. 5 per bag.

44. Out of a square of side 10 cm, a strip is cut from all sides (as shown in the figure given below). Find the area of strip cut.

1.5cm

1.5cm

1.5cm

1.5cm

1.5cm

10m
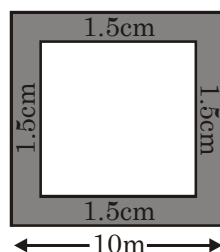
45. Find the width of the rectangle in following if length of wire remains same in both cases.

Square

←— 20 cm —→

Rectangle

←—— 15 cm ——→
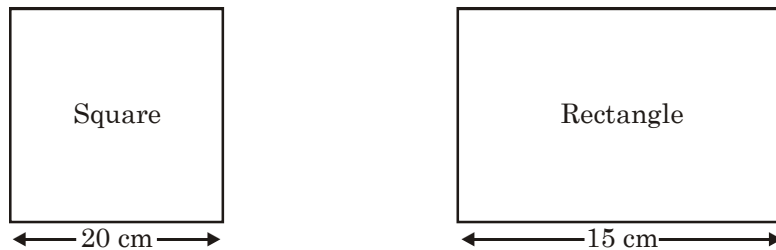
46. A boundary is to be made for a picture as shown in the figure below. Find the area of the whole picture including boundry.

30 cm

←15 cm→

←—— 20 cm ——→
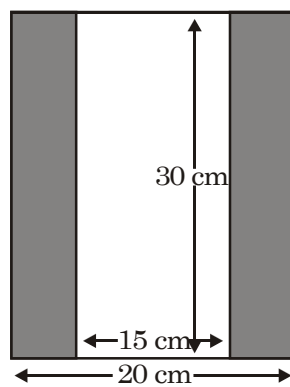
47. Inside a square park of side 100 m, a rectangular musical fountain is to be made and remaining portion is grassy. Find the area of grassy portion.

50m

←40m→

←—— 100m ——→
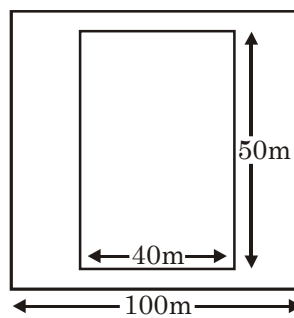
48. Inside a rectangular park, a path of width 5m is to be made along all sides. Find the area of the path.

5 m

5 m

5 m

5 m

100m

5 m

←—— 120 m ——→
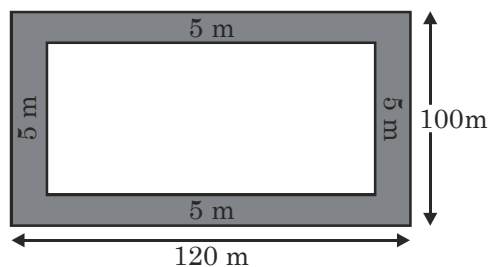
49. A wooden frame is to be made outside a picture as shown in the figure given below. Find the area of wood required.
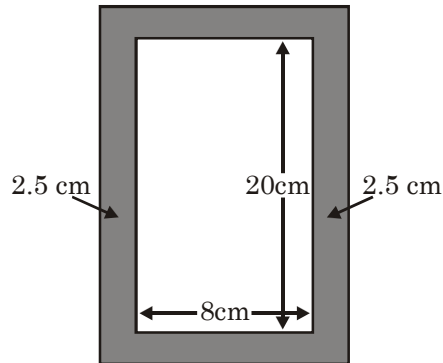
50. A rectangular ground needs fencing on 3 sides as a wall of length 100 m will act as fence on the fourth side. Find the cost of fencing @ Rs. 15 per meter.
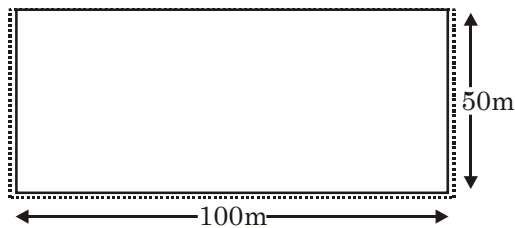
ANSWERS

1.	15 cm^2	2.	14 cm^2
3.	14 cm	4.	4.4 cm
5.	b = 20 cm; P = 84 cm	6.	Breadth = 15 cm
7.	1200 cm^2	8.	4500 m^2
9.	154 m	10.	88 m
11.	36 cm	12.	154 cm^2
13.	616 cm^2	14.	49 cm
15.	132 cm, 1320 cm or 13.2 meter	16.	2 : 5
17.	11 m	18.	5 cm
19.	$r = 7$ cm	20.	874 m
21.	35 cm	22.	20 cm^2
23.	12.25 cm^2	24.	(i) 35 cm^2 (ii) 9.5 cm^2
25.	16 cm	26.	3 cm^2

27.	10.5 cm^2	28.	88 cm
29.	10 cm	30.	284 cm^2
31.	41 m^2	32.	152 cm^2
33.	42 m^2	34.	36 cm
35.	440 m^2	36.	16 cm
37.	1600 m^2	38.	4 cm
39.	Rs. 500	40.	10 m
41.	50 cm	42.	300 cm^2
43.	Rs. 3050	44.	51 cm^2
45.	25 cm	46.	600 cm^2
47.	8000 m^2	48.	2100 m^2
49.	165 cm^2	50.	Rs. 3000.

RAPID FIRE

1. What is the area of a square whose perimeter is 40 cm?

2. Find the area of a rectangle whose dimensions are 5 cm × 4 cm.

3. Find the perimeter of a rectangle whose length is 7.6 cm and breadth is 2.4 cm.

4. Find the area of a square whose side is 6.5 cm.

5. Find the area of a triangle which has base = 10 cm and altitude = 2 cm.

6. Find the perimeter of a square field whose side is 3.5 cm.

7. What is the area of a circle whose radius = 7 cm?

8. If the radius of a circle is 14 cm, find its circumference.

9. Find the area of a parallelogram having base = 15 cm and corresponding altitude = 9 cm.

10. If the area of a square is 196 cm^2, find its side.

ANSWERS

1. 100 cm^2
2. 20 cm^2
3. 20 cm
4. 42.25 cm^2
5. 10 cm^2
6. 14 cm
7. 154 cm^2
8. 88 cm
9. 135 cm^2
10. 14 cm

CHAPTER 12

ALGEBRAIC EXPRESSION

Poits to Remember :

1. Algebraic Expression is formed from variables and constants.

2. (*i*) Like terms are those which have same algebraic factors (*ii*) Terms which have different algebaric factors are called unlike terms.

3. Any expression with one or more terms is called a polynomial. In each term of a polynomial, power of variables is a positive integer.

QUESTIONS

1. Add the like terms : $\frac{2}{3}x^2y$, $\frac{-3}{7}x^2y$, $\frac{2}{7}x^2y^3$

2. Add the unlike terms : $8x$, $\frac{-4}{3}x$, $\frac{2}{3}y$, $3p$

3. Add the unlike terms : $1x^2$, $2y$, $3t$, $4x^2$

4. Add the terms : x^2 and $-3y^2$

5. What is the numerical coefficient of algebraic expression $13 - y^2$.

6. Add all the terms : $12x$, 12, $25x$, $-25y$, 1, x, $12y$, y, -25

7. Write the coefficient of y^2 of algebraic expression.

    $2x^2y - 15xy^2 + 7y^2$

8. Add the algebraic expression :

    $3x + 11$ and $-2x + y$

9. Subtract $x + y$ from $\frac{3}{2}x - \frac{5}{2}y$

10. Find the value of the following expression for $x = 2$

    $15x - 5x^2$

11. Subtract $24ab - 10b + 18a$ from $26ab - 8b - 7a$.

12. What should be added to $x^2 + y^2$ to get $2x^2 + 3xy$?

13. Find the value of the given algebraic expression when $x = -2$, $10x - 2$

14. Find the value of the given algebraic expression when $x = -2$, $5x^2 + 4x - 2$

15. Find the value of Algebric Expression when $x = 2$ $x^2 - 3x + 5$

16. Find the value of $7a - 4b$ when $a = 2$ $b = -2$

17. Evaluate $\dfrac{x}{5} - \dfrac{y}{5}$ when $x = 2$ $y = -3$

18. If $Z = 5$ find the value of $2 - 3(4 - Z)$

19. If $P = -6$ find the value of $\dfrac{2P^2}{3} - 1$.

20. If $a = 2$ find the value of $a\left(1 + \dfrac{1}{a}\right)$.

21. Evaluate : $2a^2 + 3b^2 + 1c^2$ if $a = 1$, $b = 0$, $c = -4$

22. Find the value of $(a - b)(a + b) - (2a - b)(a + b)$ if $a = 3$, $b = 2$.

23. If $a + b = 5$, find the value of $\dfrac{1}{2}a + \dfrac{1}{2}b$.

24. Find the value of $3(2a + b)$ if $a = 2$, $b = -1$.

25. Find the value of $5x + 3$ if $x = 9$.

26. What should be added into $x^2 + 2x$ to obtain $x^2 + 9$?

27. What should be added into $x^2 + x + a$ to obtain $x^2 + x - 3$?

28. What should be subtracted from $3a + 7b - 16$ to get $2a + 8b$?

29. If $a = 3$, $b = -3$, find the value of $a^2 + b^2$.

30. If $a = 5$, $b = -5$, find the value of $a^2 - b^2$.

31. Simplify the following expression if $x = 8$

    $5x + 6(x - 3)$

32. If a side of an equilateral triangle is $7x$ units then find the perimeter of the triangle.

33. Find the perimeter of a square whose side is $4a$ cm.

34. Find the perimeter of a regular pentagon whose side is $4x$ cm.

35. Side of a square is $2x$ cm. Find its area.

36. Base of a triangle is $2x$ units and its height is $3y$ units. Find the area of the triangle.

37. Each ☐ consists of 4 line segments. Find the total number of line-segments in the following figure : ☐☐☐☐☐

38. What is the number of diagonals that can be drawn from one vertex in an octagon?

39. What is the number of diagonals that can be drawn from one vertex in a heptagon.

40. Subtract $x^2 - 3xy + 7y^2 - 5$ from $6xy - 4x^2 - y^2 + 5$

41. By how much is $2x^3 + 7x^2 - 5x + 6$ greater than $x^3 - 2x^2 + x + 5$?

42. By how much is $a^2 - 7a + 5$ less than $3a^2 + 2a + 5$?

43. Subtract $1 - 5y^2$ from $y^3 + 7y^2 + y + 1$.

44. Simplify : $2x - \left\{5y - \left(x - 2y\right)\right\}$

45. Simplify : $5a - \left\{3a - \left(2 - a\right) + 4\right\}$.

46. What is the coefficient of y in the term $\dfrac{4}{3}x^2yz^2$?

47. Add the algebraic expression :

   (i) $7x - 4$ and $3x + 1$

   (ii) Find the coefficient of x.

48. Add $a^2 + b^2 + c^2 - 3abc$ and $a^2 - b^2 + c^2 + abc$.

49. Add the expressions $7a - 5ab + 4b,\ -6a - ab - 8b$ and $-4a + 2ab + 3b$.

50. Add $2x^2 - 3x + 1$ to the sum of $3x^2 - 2x$ and $3x + 7$.

51. Simplify :

   (i) $12a^2b + 3ba^2$

   (ii) Also find the coefficient of the result.

ANSWERS

1. $\dfrac{5}{21}x^2y$ 2. $\left(\dfrac{2}{3}y + 3p\right)$

3. $(2y + 3z)$ 4. $x^2 - 3y^2$

5. -1 6. $-12x - 12y - 12$

7. $(-15x,\ 7)$ 8. $(x + y + 11)$

9. $\left(\dfrac{x}{2} - \dfrac{7}{2}y\right)$ 10. 10

11. $2ab + 2b - 25a$

12. $x^2 + 3xy + y^2$

13. -22

14. 10

15. 3

16. 22

17. 1

18. 5

19. 23

20. 3

21. 18

22. (-15)

23. $\dfrac{5}{2}$

24. 9

25. 48

26. $-2x + 9$

27. $-3 - a$

28. $(+ a - b - 16)$

29. 18

30. 0

31. 70

32. $21x$ units

33. $16a$ cm

34. $20x$ cm

35. $4x^2$ cm^2

36. $3xy$ square units

37. 16

38. 5

39. 4

40. $9xy - 5x^2 - 8y^2 + 10.$

41. $x^3 + 9x^2 - 6x + 1$

42. $2a^2 + 9a$

43. $y^3 + 12y^2 + y$

44. $3x - 7y$

45. $a - 2$

46. $\dfrac{4}{3} x^2 z^2$

47. $10x - 3$, 10

48. $2a^2 + 2c^2 - 2abc$

49. $-3a - 4ab - b$

50. $5x^2 - 2x + 8$

51. $(15a^2 b, 15)$

EXPONENTS AND POWERS

Points to Remember :

Recall that we may write $3 \times 3 \times 3 \times 3$ as 3^4 and read it as 3 raised to the power 4. In 3^4, we call 3 as base and 4 as exponent. Similarly, when an integer 'a' is multiplied 'n' times, the result is expressed as a^n. Here 'a' is called the base and 'n' is called the exponent.

Difference between Exponent and Power :

For example : $2^3 = 2 \times 2 \times 2 = 8$

Here   2 = Base

                          3 = Exponent

                          8 = Third power of 2.

Laws of Exponents :

(i) $a^m \times a^n = a^{m+n}$

(ii) $\dfrac{a^m}{a^n} = a^{m-n} \quad (m > n)$

(iii) $(a^m)^n = a^{mn}$

(iv) $a^m \times b^m = (ab)^m$

(v) $a^m \div b^m = \left(\dfrac{a}{b}\right)^m$

(vi) $a^{-m} = \dfrac{1}{a^m}$

Further recall that,

(i) $a^\circ = 1$

(ii) $(-1)^{\text{even number}} = 1$

(iii) $(-1)^{\text{odd number}} = -1$

Standard Form

When a number is expressed as a decimal between 1.0 and 10.0 multiplied by a power of 10 it is called its standard form. Thus, $A \times 10^n$ is in the standard form where $1 \le A < 10$ and n is an integer. For example, a number 2806196 can be expressed in the standard form as 2.806196×10^6.

QUESTIONS

1. Find the base and exponent of 7^6.

2. Find the base and exponent of $(-41)^{91}$.

3. Give exponential form for $(-P) \times (-P) \times (-P) \times (-P) \times (-P)$

4. Give exponential form for $8324 \times 8324 \times 8324 \times 8324$

5. What is the square of 21?

6. What is the cube of 11?

7. What is the square of -16?

8. What is the cube of -50?

9. Find the value of $(-1)^{501}$?

10. $3^3 \times 27^2 = 3^{\square}$

11. $25^5 \times 125^4 = 5^{\square}$

12. $100^7 \div 10^4 = 10^{\square}$

13. $7^3 \times 7^7 = \underline{\hspace{2cm}}$

14. $4^{14} \times 4^4 = \underline{\hspace{2cm}}$

15. $4^{48} \div 4^6 = \underline{\hspace{2cm}}$

16. $5^{\left(2^5\right)} = 5^x$ find x.

17. $(64)^3 = (4)^x$ find x.

18. Find the value of x if $(2^6 \div 2^{-3}) \times 2^{14} = 2^x$.

19. Find the value of $\left[\left(-16^6\right) \div \left(-16\right)^3\right] \times \left(-16\right)^{-3}$

20. Express $\dfrac{256}{81}$ in the exponential form.

21. Express $\dfrac{-27}{125}$ in the exponential form.

22. Find the value of $\left(\dfrac{-7}{5}\right)^{13} \div \left(\dfrac{-7}{5}\right)^{15}$

23. Find the value of $3^0 + 5^0 + 19^0$.

24. Find the value of $(7^0 + 3^0) \times (8^0 - 5^0)$

25. Find the value of $4^0 \times 6^0 \times 100^0$

26. Solve : $\dfrac{\left(\dfrac{4}{7}\right)^5 \times \left(\dfrac{2}{3}\right)^2}{\dfrac{4}{9} \times \left(\dfrac{4}{7}\right)^3}$

27. Find the value of : $\left(\dfrac{1}{5} \div \dfrac{1}{4}\right)^3$

28. Find $4^{-1} - 8^{-1}$

29. Find the value of $\left(\dfrac{4}{9}\right)^{-5} \times \left(\dfrac{4}{9}\right)^2 \times \left(\dfrac{4}{9}\right)^3$

30. Change into positive power (exponent) : $\left(\dfrac{3}{5}\right)^{-4}$

31. Change into positive power (exponent) : $11^{-7} \times 11^{-6}$

32. Change into positive power (exponent) : $\left[\left(\dfrac{4}{5}\right)^{-2}\right]^4$

33. Change into negative exponent : $\left(\dfrac{5}{7}\right)^2$

34. Change into negative exponent : $\left[(3)^2\right]^5$

35. Change into negative exponent : $(7^5 \div 7^2) \times 3^3$

36. $(-19)^{11} \div (-19)^{15} = \dfrac{1}{(-19)^{\square}}$

37. Solve and give the answer in exponential form :

$\left(\dfrac{3}{14}\right)^{12} \times \left(\dfrac{3}{14}\right)^8 \times \left(\dfrac{3}{14}\right)^0$

38. Give the answer in exponential form : $\left[\left(\dfrac{-4}{15}\right)^2\right]^8$

39. Find the value of $2^0 + 3^0 - 6^0$.

40. Give the answer in the form of rational number :

$\left(\dfrac{3}{5}\right)^{-2} \times \left(\dfrac{4}{5}\right)^{-2}$

41. Solve : $\left(\dfrac{1}{4}\right)^{-2} + \left(\dfrac{1}{2}\right)^{-2} + \left(\dfrac{1}{3}\right)^{-2}$

42. By what exponent should $(3)^{-4}$ be multiplied so that the product may be equal to 3.

43. Find the value of x if $\left(\dfrac{-8}{3}\right)^{11} \div \left(\dfrac{-8}{3}\right)^{3} = \left(\dfrac{-8}{3}\right)^{2x+2}$

44. Find the value of a if $\left[\left(\dfrac{2}{11}\right)^{8}\right]^{3} = \left(\dfrac{2}{11}\right)^{a+1}$

45. Find the reciprocal of $\left(\dfrac{1}{3}\right)^{-2} \div \left(\dfrac{5}{3}\right)^{-2}$

46. Solve $\left[\left(\dfrac{3}{2}\right)^{2}\right]^{2} \times \left(\dfrac{1}{2}\right)^{-2} \times 3^{0}$

47. Solve and express the result in exponential form :

$$\dfrac{3^{21} \times 13^{2}}{13^{17} \times 3^{6}}$$

48. Solve and express as a rational number :

$$\left[\left(\dfrac{-3}{4}\right)^{3} \times \dfrac{9}{16}\right] \div \left(\dfrac{-3}{4}\right)^{3}$$

49. Find the value of $(3^{-2} - 5^{-1}) \times 17^{0}$

50. Fill the box : $\left(\dfrac{3}{8}\right)^{3} \times \left(\dfrac{3}{8}\right)^{\square} = 1$

51. What is the standard form of 390878?

52. The distance of the moon from the earth is 384000 km. What is its standard form?

53. What is the standard form of 0.0034256?

54. What is the expanded form in terms of the standard form for the number 53984?

55. What is the number obtained from the expanded form $4 \times 10^{3} + 2 \times 10^{2} + 9 \times 10^{1} + 3 \times 10^{0}$?

ANSWERS

1.	Base = 7 Exponent = 6	2.	Base = -41 Exponent = 91
3.	$(- P)^5$	4.	$(8324)^4$

5. 441

6. 1331

7. 256

8. 125000

9. -1

10. 3^9

11. 5^{22}

12. $(10)^{10}$

13. 7^{10}

14. 4^{18}

15. 4^{42}

16. 32

17. $x = 9$

18. 23

19. 1

20. $\left(\dfrac{4}{3}\right)^4$

21. $\left(\dfrac{-3}{5}\right)^3$

22. $\dfrac{25}{49}$

23. 3

24. 0

25. 1

26. $\dfrac{16}{49}$

27. $\dfrac{64}{125}$

28. $\dfrac{1}{8}$

29. 1

30. $\left(\dfrac{5}{3}\right)^4$

31. $\left(\dfrac{1}{11}\right)^{13}$

32. $\left(\dfrac{5}{4}\right)^8$

33. $\left(\dfrac{7}{5}\right)^{-2}$

34. $\left(\dfrac{1}{3}\right)^{-10}$

35. $\left(\dfrac{1}{21}\right)^{-3}$

36. $\dfrac{1}{\left(-19\right)^4}$

37. $\left(\dfrac{3}{14}\right)^{20}$

38. $\left(\dfrac{-4}{15}\right)^{16}$

39. 1

40. $\dfrac{625}{144}$

41. 29

42. $(3)^5$

43. $x = 3$

44. $a = 23$

45. $\dfrac{1}{25}$

46. $\dfrac{81}{4}$

47. $\left(\dfrac{3}{13}\right)^{15}$

48. $\dfrac{9}{16}$

49. $\dfrac{-4}{45}$

50. -3

51. 3.90878×10^5

52. 3.84×10^5 km

53. 3.4256×10^{-3}

54. $5 \times 10^4 + 3 \times 10^3 + 9 \times 10^2 +$
    $8 \times 10^1 + 4 \times 10^0$

55. 4293

CHAPTER 14

SYMMETRY

Points to Remember :

❑ A line that divides a figure into two identical shapes is called symmetrical line.

❑ There may be more than our symmetrical lines in a figure.

❑ The angle by which a figure is rotated to get same position is called angle of rotation.

❑ Complete rotation is 360°.

❑ Figure having no line of symmetry can still have rotational symmetry.

❑ The number of times the shape coincides with the original shape while rotating it till complete rotation.

❑ Every object has atleast a rotational symmetry of order 1 as it ocupies the same position after our complete rotation. (be it clockwise or anti-clockwise).

QUESTIONS

1. In the given equilateral triangle

    (*i*)   find the centre of rotation and

    (*ii*) the angle of rotation

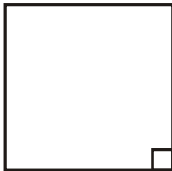2. Find the number of lines of symmetry in the given figure.
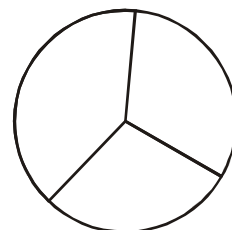
3. In the given rectangle–

    (*i*) State the number of lines of symmetry

    (*ii*) and the angle of rotation.

4.

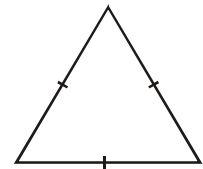   In the given figure

    (*i*) Find the number of lines of symmetry

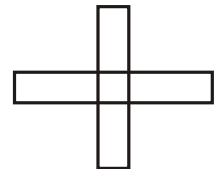   (*ii*) What is the order of rotational symmetry?

5. In the adjoining figure, find the

    (*i*) Number of line of symmetry

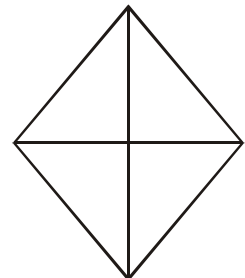   (*ii*) Order of rotational symmetry.

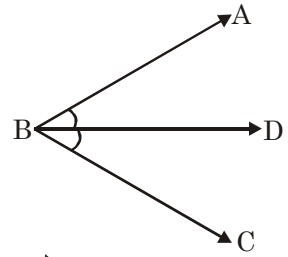6. In the given figure, find the

    (*i*) order of rotational symmetry, and

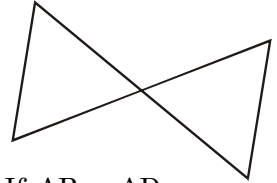   (*ii*) degree measure of the angle of rotation.

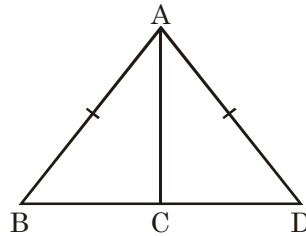7. In the given figure, find the order of rotational symmetry.

8. Which ray is the line of symmetry in the given figure?

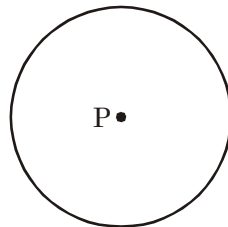9. Find the number of lines of symmetry in the given figure.

10. Which line-segment is the line of symmetry in the given figure. If AB = AD

11. Find order of rotational symmetry in the given figure.

12. In the given circle, how many lines of symmetry are there and what is the centre of rotation?
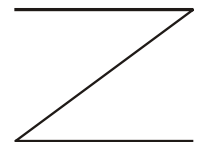
13. In a regular hexagon how many line of symmetry are there? What is the centre of rotation?
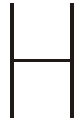
14. In a regular pentagon, how many lines of symmetry are there? Find the order of rotational symmetry.

15. How many lines of symmetry are there in the given figure? Also find the order of

rotational symmetry.

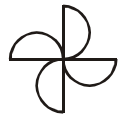16. Find the number of lines of symmetry in the given figure and also find the order of rotational symmetry.

17. How many lines of symmetry does the given figure have and what is the order of rotational symmetry?

18. What is the order of rotational symmetry?

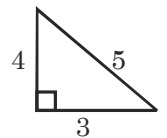19. What is the order of rotational symmetry?

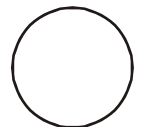20. How many lines of symmetry are there in the given figure?

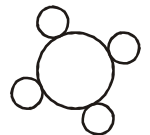21. How many lines of symmetry does the given figure have?

22. How many lines of symmetry are there in the given figure?

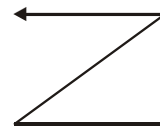23. What name can you give to the line of symmetry in the given figure?

24. Find the order of rotational symmetry and angle of rotational symmetry.

25. Find the line of symmetry.

26. Find order of rotational symmetry.

27. Angle of rotation of a figure is 40º. What is the number of lines of symmetry?

28. Angle of rotation of a figure is 120°. What is the number of lines of symmetry?

29. Angle of rotation of a figure is 25°. What is the number of lines of symmetry?

30. What is the centre of rotation of an equilateral triangle?

31. Angle of rotation of a figure is 35°. What is the number of lines of symmetry?

32. If the angle of rotation of a figure is 36°, what is the number of lines of symmetry?

ANSWERS

1.	Centroid, 120°	2.	3
3.	2, 180°	4.	4, 4
5.	3, 3	6.	4, 90°
7.	One	8.	BD
9.	Two	10.	AC
11.	2	12.	Infinite, Centre P
13.	6, Centre of Hexagon	14.	5, 5
15.	Nil, Two	16.	2, 2
17.	4, 2	18.	One
19.	4	20.	One
21.	One	22.	Nil
23.	Diameter	24.	4, 90°
25.	Nil	26.	One
27.	Nine	28.	3
29.	Nil	30.	Centroid
31.	Nil	32.	10

VISUALISING SOLID SHAPES

The circle, the square, the rectangle, the quadrilateral and the triangle are examples of **plane figures**. The cube, the cuboid, the sphere, the cylinder, the cone and the pyramids are examples of **solid shapes**.

❑ A **net** is a skeleton outline of a solid that can be folded to make it.

❑ The sum of the number of dots on the opposite faces of a dice is always 7.

QUESTIONS

1. Count the number of cubes in the given figures :
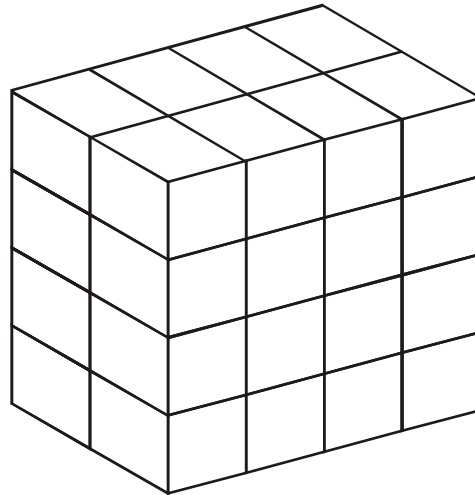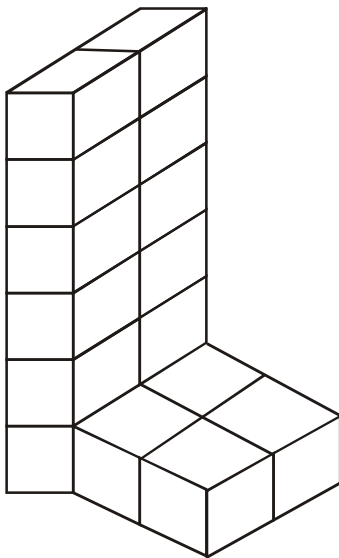
2. How many faces does a cube have? (6)

3. How many vertices does a cuboid have? (8)

4. How many faces does a cone have? (2)

5. How many edges does a triangular pyramid have? (6)

Note : Net of a dice is given below.
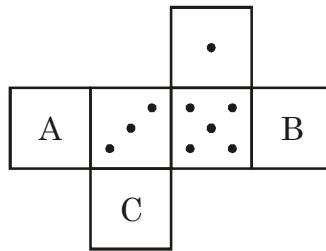
6. Find the number

   (*i*)   of dots on the face A of the dice?

   (*ii*)   What is the number of dots on the face B of the dice?

8. What is the sum of dots on faces *B* and *C* in the given figure?

9. What is the sum of dots in faces *A* and *B* in the given figure?

10. How many squares and triangles are in the net of triangular prism?

11. How many triangles are in the net of triangle pyramid?

12. How many edges does a sphere have?

ANSWERS

1.	16, 32	2.	6
3.	8	4.	2
5.	6	6.	2
7.	4	8.	10
9.	6	10.	1, 4
11.	4	12.	0.

CHAPTER 16
# MISCELLANEOUS EXERCISE

1. The sum of two integers is 6. If one of them is –3, find the other integer.

2. How much less is –2 than –6?

3. What do we get on subtracting 4 from –4?

4. What is the reciprocal of $2\dfrac{5}{6}$?

5. By what number should $1\dfrac{1}{2}$ be multiplied to get $\dfrac{5}{6}$?

6. By what number should $16\dfrac{2}{3}$ be divided to get 5?

7. Find the value of $0.3 \times 0.3 \times 0.3 \times 0.3$.

8. Find the value of $0.0004 \div 0.8$.

9. What should be added to $\dfrac{-2}{3}$ to get $\dfrac{-1}{6}$?

10. What should be subtracted from –3 to get $-\dfrac{1}{3}$?

11. The product of two rational numbers is $\dfrac{-8}{9}$. If one of them is $\dfrac{-4}{15}$, find the other rational number.

12. Find the reciprocal of $\dfrac{-1}{3}$.

13. Find the multiplicative inverse of $\dfrac{-2}{3}$.

14. Find the value of $[3^{-1} - 6^{-1}]^{-1}$.

15. Find the value of $\left[\left\{\left(\dfrac{-1}{2}\right)^3\right\}^2\right]^{-1}$.

16. What should be subtracted from $2 - x + x^2$ to get $x - 1$?

17. What should be added to $2 - x + x^2$ to get $x - 1$?

18. If $\dfrac{x + 2}{x - 2} = \dfrac{7}{3}$, find the value of x.

19. Two complementary angles differ by 6°. Find the measure of both the angles.

20. Two supplementary angles differ by 40°. Find the measure of both the angles.

21. A number when added to its two-third gives 65. Find the number.

22. The ages of two persons are in the ratio 7:5. Ten years hence, the ratio of their ages will be 9:7. Find their present ages.

23. Rs. 640 is divided among A, B, C in the ratio 2 : 3 : 5. Find share of each.

24. Find third proportion to 8 and 12.

25. Find mean proportion between 6 and 24.

26. What must be added to each of the numbers 5, 9, 7, 12 to get the numbers which are in proportion?

27. If 20 men can finish a piece of work in 20 days, in how many days can 25 men do it?

28. 8% of a number is 6. Find the number.

29. What per cent of Rs. 75 is Rs. 12?

30. On reducing the cost of a table by 6% it becomes Rs. 329. Find the original cost of the table.

31. 70% of students in a school are boys. If the number of girls is 240. How many boys are there in the school?

32. An article is sold for Rs. 120 at a gain of 25%. Find its cost price.

33. By selling an article for Rs. 144 a man loses 10%. At what price should be sell it to gain 10%?

34. If the selling price of 5 articles is same as the cost price of 6 articles, find the gain or loss percent.

35. A shopkeeper gives a discount of 25% on the marked price of a watch. If the watch is sold for Rs. 750, what is its marked price?

36. Find the simple interest on Rs. 7500 at the rate of 4% per annum for 6 months.

37. At what rate of simple interest per annum a sum becomes double in 5 years?

38. Find the supplement of an angle of 50°.

39. Find the complement of an angle of 65°.

40. In a triangle ABC, if $\angle A = 75°$ and $\angle B = 55°$, find the measure of $\angle C$.

41. In the given figure AOB is a straight line and $\angle BOC = 50°$. Find $\angle AOC$.
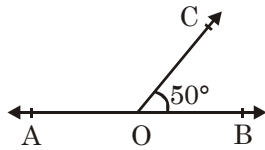
42. In the given figure, $\angle A = 60°$, $CE \parallel BA$ and $\angle ECD = 70°$. Find $\angle ABC$.
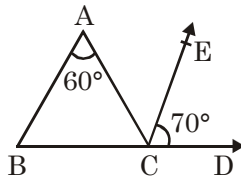
43. The side BC of ΔABC is produced to D such that $\angle ACD = 110°$. If $\angle ABC = 70°$, Find angles $\angle BAC$ and $\angle BCA$.

44. In a ΔABC right angled at C, if $AB = 13$ cm and $BC = 12$ cm, find AC.

45. The length of a diagonal of a square is 6 cm. Find its area.

46. The length of each side of equilateral triangle is 8 cm. Find its area.

47. The length of rectangle is 12 cm and the length of its diagonal is 15 cm. Find the area of the rectangle.

48. The circumference of a circle is 44 cm. Find its area.

49. How many revolutions will a wheel of radius 14 cm make in covering a distance of 88 km?

50. The area of a circle is 385 cm². Find its circumference.

ANSWERS

1.	9	2.	4
3.	−8	4.	$\dfrac{6}{17}$
5.	$\dfrac{5}{9}$	6.	$3\dfrac{1}{3}$
7.	0.0081	8.	0.0005
9.	$\dfrac{1}{2}$	10.	$\dfrac{-8}{3}$
11.	$\dfrac{10}{3}$	12.	−3
13.	$\dfrac{-3}{2}$	14.	6

15.	64	16.	$3 - 2x + x^2$
17.	$2x - 3 - x^2$	18.	5
19.	48°, 42°	20.	110°, 70
21.	39	22.	35 years, 25 years
23.	Rs. 128, Rs. 192, Rs. 320	24.	18
25.	12	26.	3
27.	16 days	28.	75
29.	16%	30.	Rs. 350
31.	560	32.	Rs. 96
33.	Rs. 176	34.	Gain : 20%
35.	Rs. 1000	36.	Rs. 150
37.	20% per annum	38.	130°
39.	25°	40.	50°
41.	130°	42.	70°
43.	40° and 70°	44.	5 cm
45.	18 cm²	46.	$16\sqrt{3}$ cm²
47.	108 cm²	48.	154 cm²
49.	100000	50.	22 cm