

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

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

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Class - X

MATHEMATICS

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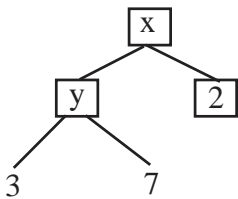
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CHAPTER-1

Real Numbers

1. $1000 = 2^x \cdot 5^y$. What is the value of x and y .
2. Which prime numbers will be repeatedly multiplied in prime factorization of 3200.
3. Find the digit at units place of 8^n if n is 9.
4. The prime factors of denominator of fraction $\frac{14}{160}$ is $2^x \cdot 5$. What is the value of x ?
5. If H.C.F. of two number is 68 and 85 is 17. What is the L.C.M. of two numbers.
6. What is the H.C.F. of 95 and 152?
7. Which number when divided by 18 gives the quotient and remainder as 7 and 4.
8. When 176 is divided by a number it gives the remainder 5 and quotient 9. What is the number?
9. By which smallest irrational number $\sqrt{27}$ be multiplied so as to get a rational number?
10. What is the product of $(\sqrt{7} + \sqrt{5})$ and $(\sqrt{7} - \sqrt{5})$?
11. Which rational number is equivalent to $0.\bar{7}$?
12. What is the sum of $0.\bar{3}$ and $0.\bar{4}$.
13. $0.\bar{17} = \frac{p}{q}$, where p and q are integers and $q \neq 0$. What is the value of $\frac{p}{q}$?
14. Which smallest irrational number should be added to $(3 + \sqrt{5})$ to get a rational number?
15. Give the fractional form of $1.2\bar{5}$.
16. Which number should be multiplied to $(\sqrt{5} - \sqrt{3})$ to get a rational number?
17. How much is $7\sqrt{5} + 8\sqrt{5}$?

18. What is the value of :- $\sqrt{5} \times \sqrt{7} \times \sqrt{15} \times \sqrt{21}$

19.  What is the value of x?

20. Division of 133 by 19 gives remainders = 0. What is the H.C.F. (133,9)?

21. Give the decimal representation of $\frac{13}{11}$.

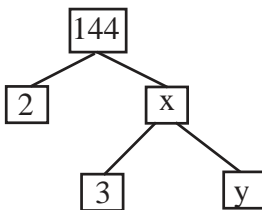
22. If $\frac{3}{7}$ when written in decimal representation is $0.\overline{428571}$ then what is the decimal representation of $\frac{5}{7}$.

23. If $\frac{6}{7} = 0.\overline{857142}$ then what is the decimal representation of $\frac{4}{7}$

24. What will be the units digit of 7^5 ?

25. Find the digit at units place of 4^5 .

26. If unit's digit of 7^3 is 3 then what will be the unit's digit of 7^{11} ?

27.  What is the value of x and y?

28. What will be the unit's digit of $(7 \times 3)^{21}$?

29. Which digit you will get at units place of 6^{18} ?

30. Simplify :- $(2 + \sqrt{3}) + (5 - \sqrt{3}) + (6 + \sqrt{3}) + (7 - \sqrt{3})$

31. Simplify :- $(\sqrt{3} - 5) + (6 - 2\sqrt{3}) + (2 + \sqrt{3})$

32. What is the multiplicative inverse of $\sqrt{5} - 2$.

33. Simplify :- $\frac{(\sqrt{7}-\sqrt{3})(\sqrt{7}+\sqrt{3})}{(\sqrt{7}+3)+(3-\sqrt{7})}$

34. Express as a rational number :- $\frac{(4-\sqrt{3})(4+\sqrt{3})}{(\sqrt{5}-2)(\sqrt{5}+2)}$

35. If L.C.M. of two numbers 16 & 28 is 112, then what is the H.C.F. of these numbers.

36. Find the square of $(2+\sqrt{3})$.

37. Simplify :- $(3+\sqrt{5})^2(3-\sqrt{5})^2$

38. What is the H.C.F. of 152 and 171?

39. If H.C.F. of two numbers 420 and 441 is 21 then find the L.C.M. of these two numbers?

40. H.C.F. and L.C.M. of two numbers are 19 and 380 respectively. If one of the numbers is 95, what is the other number?

CHAPTER 1
Answer
(Real Numbers)

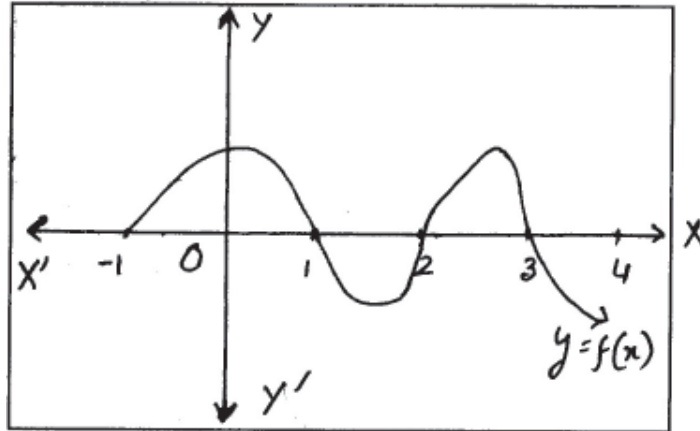
- | | | | |
|-----|-----------------------|-----|-----------------------|
| 1. | $x=3, y=3$ | 22. | $0.\overline{714285}$ |
| 2. | 2 and 5 | 23. | $0.\overline{571428}$ |
| 3. | 8 | 24. | 7 |
| 4. | $x=4$ | 25. | 4 |
| 5. | 340 | 26. | 3 |
| 6. | 19 | 27. | $x=72, y=24$ |
| 7. | 130 | 28. | 1 |
| 8. | 19 | 29. | 6 |
| 9. | $\sqrt{3}$ | 30. | 20 |
| 10. | 2 | 31. | 3 |
| 11. | $\frac{7}{9}$ | 32. | $\sqrt{5}+2$ |
| 12. | $0.\overline{7}$ | 33. | 2 |
| 13. | $\frac{17}{99}$ | 34. | 13 |
| 14. | $(-\sqrt{5})$ | 35. | 4 |
| 15. | $1\frac{23}{90}$ | 36. | $7+4\sqrt{3}$ |
| 16. | $(\sqrt{5}+\sqrt{3})$ | 37. | 16 |
| 17. | $15\sqrt{5}$ | 38. | 19 |
| 18. | 105 | 39. | 8820 |
| 19. | 42 | 40. | 76 |
| 20. | 19 | | |
| 21. | $1.\overline{18}$ | | |

CHAPTER-2

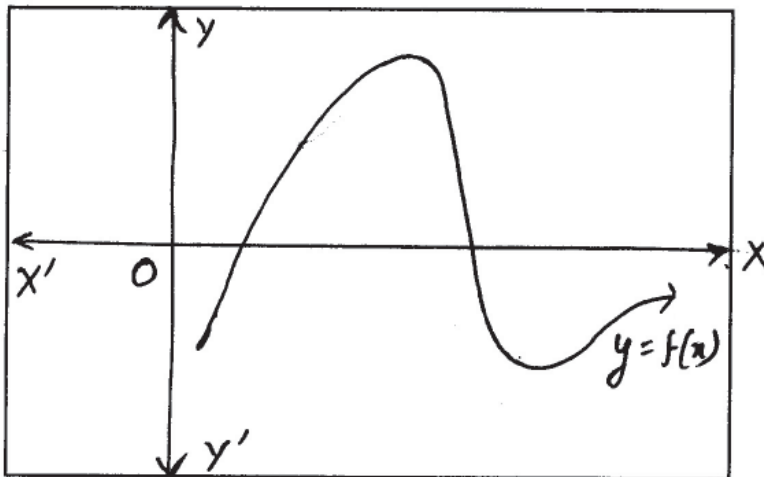
Polynomials

1. What is the coefficient of x^2 in the polynomial $P(x) = 3x^3 - 10(x - x^2) - 5x^2 - 2$?
2. Find the value of the polynomial $P(x)$ when $x = 3$.
 $P(x) = x^2 - 4x + 7$
3. What is the value of $f\left(-\frac{3}{2}\right)$ where $f(x) = 4x^2 + 3x + \frac{7}{2}$?
4. If $f(x) = x^2 - 5x - 14$, find the value of $f(7)$.
5. Find the zeros of the polynomial $x^2 - 15x - 34$.
6. What should be added to the polynomial $x^2 - 5x + 4$, so that 3 is the zero of the polynomial?
7. Which of the numbers 3, 2, -2, 1 are zeros of the polynomial $x^2 - 4$?
8. What should be subtracted from the polynomial $x^2 - 16x + 30$ so that $x = 15$ is a zero of the polynomial?
9. Find the quotient when $x^2 - 7x + 12$ is divided by $(x - 3)$.
10. Find the polynomial whose zeros are $\sqrt{2}$ and $-\sqrt{2}$.
11. Find the value of a in the polynomial $x^2 + ax - 30$ if 5 is the zero of the given polynomial.
12. What will be the remainder if $f(x) = x^3 + 4x^2 - 3x + 1$ is divided by $(x - 2)$?
13. If $f(x) = 3x^2 - 7x + 8$, find $f(-2)$.
14. In the polynomial $3x^2 - 4x - 7$, find the sum of two zeros of the polynomial.
15. What is the product of zeros of the polynomial $x^2 - 11x + 30$?
16. Which quadratic polynomial have its zeros as $\frac{1}{4}$ and $\frac{3}{4}$?
17. What is the value of 'k' in the polynomial $P(x) = x^2 + 11x + k$ if -4 is a zero of the polynomial?
18. Find both the zeros of the polynomial $2x^2 - 3x - 14$.
19. If $(x + 2)$ is a factor of $x^2 + ax + 2b$ and $a + b = 4$ then what is the value of a and b ?

20. What is the quotient if $x^3 - 1$ is divided by $x^2 + x + 1$?
21. For what value of x both the polynomials $3x^2 + 8x + 4$ and $x^2 - x - 6$ becomes zero?
22. From the graph given below find the number of zeros of the polynomial $y = f(x)$.

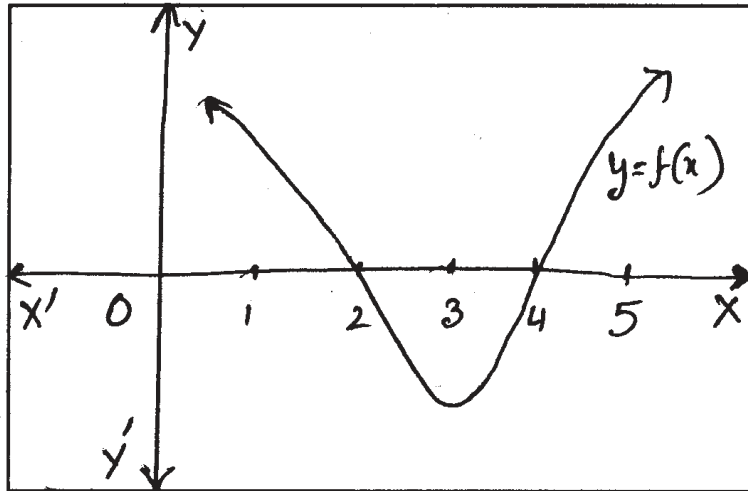


23. Find the number of zeros of the polynomial $y = f(x)$ whose graph is given below.

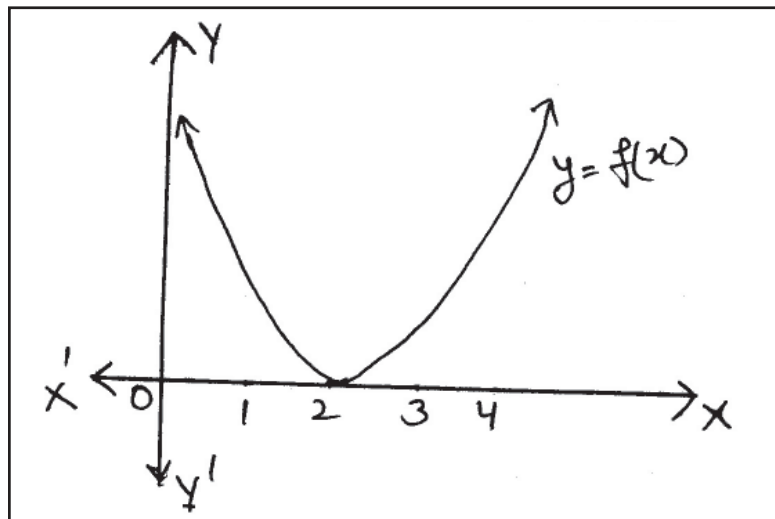


24. How many zeros does the polynomial $f(x) = (x - 1)(x + 1)(x - 2)$ have in all?
25. Find all the zeros of the polynomial $f(x) = (x - 3)(x^2 - 9x + 20)$.
26. Find sum and product of the zeros of the polynomial. $3x^2 - 14x + 11$
27. What is the quotient and remainder if $x^2 - 8x + 15$ is divided by $(x - 3)$?
28. How many maximum number of zeros a quadratic polynomial can have?
29. If one of the zero of the polynomial $P(x) = x^2 - 13x + 40$ is 8, which is the other zero?

30. Find the zeros of the polynomial whose graph is given below :-



31. Which are the two zeros of the quadratic polynomial given in figure?



32. Find the zeros of the polynomial $x^2 - 25 = 0$. Also give the sum of zeros.
33. Which quadratic polynomial have the sum and product of roots as -15 and 50 ?
34. Find the polynomial whose roots are $2\sqrt{3}$ and $3\sqrt{3}$.
35. What is the sum and product of 3 roots of the cubic polynomial $x^3 - 7x + 6$?
36. What is the three roots of the polynomial $(x + 4)(x^2 - 6x + 8)$.
37. Two roots of the polynomial $x^3 + x^2 - 9x - 9$ are 3 and -3 . What is the third root?
38. Find the quadratic polynomial whose two roots (zeros) are $3 + \sqrt{5}$ and $3 - \sqrt{5}$.

39. Complete the following :-

$$\text{Dividend} = \text{Divisor} \times \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

40. $(x - 1)$ is a factor of $(x^3 + ax^2 + bx - 11)$ and $a - b = 6$. Find a and b .

41. For what value of a , $(x = 6)$ is a zero of the polynomial $x^2 - ax - 6$?

42. Which factor is common in $x^2 - 1$, $x^4 - 1$ and $(x - 1)^2$?

43. Find the common zero of $(x^2 + 2x + 1)$, $(x^2 - 1)$ and $x^3 + 1$.

44. Which is the factor common in $6(x + 1)(x + 2)$ and $9(x^3 + 1)$?

45. For what value of x , both the polynomials $x^2 - 3x + 2$ and $x^2 - 6x + 5$ becomes zero?

46. For what value of k , $(x = -4)$ is a zero of the polynomial $2x^2 + kx - 12$?

47. Which factor is common in $x^2 + 8x + 15$ and $x^2 + 3x - 10$?

48. Reduce $\frac{x^2 + 5x + 4}{x^2 + 2x + 1}$ to lowest terms.

49. Find the cubic polynomial whose three zeros are $0, 4, -4$.

50. If $P(x) = x^2 + 5x + 2$, what is the value of $P(3) + P(2)$?

CHAPTER 2
Answer
(Polynomials)

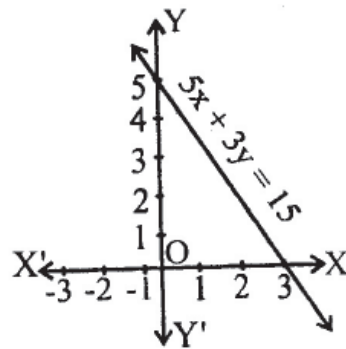
1. -15
2. 4
3. 8
4. 0
5. (17, -2)
6. 2
7. (2, -2)
8. 15
9. (x - 4)
10. $x^2 - 2$
11. $a = 1$
12. 19
13. 34
14. $\frac{4}{3}$
15. 30
16. $\frac{1}{16} (16x^2 - 16x + 3)$
17. $k = 28$
18. $\left(\frac{7}{2}, -2\right)$
19. $a = 3, b = 1$
20. (x - 1)
21. $x = -2$
22. 4 zeros
23. 2 zeros
24. 3
25. 3, 4, 5
26. $\frac{14}{3}, \frac{11}{3}$
27. quotient (x - 5), R = 0
28. Two
29. 5
30. $x = 2, x = 4$
31. 2, 2
32. (5, -5), 0
33. $x^2 + 15x + 50$
34. $x^2 - 5\sqrt{3} + 18$
35. (0, -6)
36. (2, 4, -4)
37. (-1)
38. $x^2 - 6x + 4$
39. Quotient, Remainder
40. $a = 8, b = 2$
41. $a = 5$
42. (x - 1)
43. -1
44. $3(x + 1)$
45. $x = 1$
46. $k = 5$
47. (x + 5)
48. $\frac{x+4}{x+1}$
49. $x^3 - 16x$
50. 42

CHAPTER-3

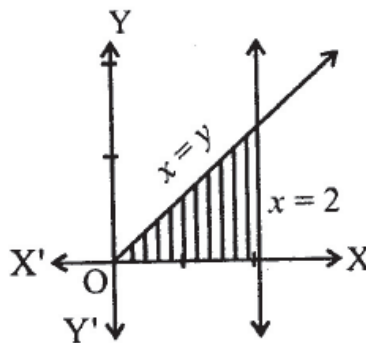
Linear Equations in Two Variables

1. How many variables are there in the equation $2x - 3y + 4 = 0$?
2. The point $(-4, 0)$ lies on which axis?
3. For what value of m the system of linear equation has unique solution?
$$2x + 3y = 7$$
$$2mx + y = 28$$
4. Find the value of y corresponding to $x = 3$ in the equation $3x + 2y = 9$.
5. Find the point on x -axis satisfying the equation $x + y = 5$.
6. Find the point on y -axis satisfying the equation $2x - 5y = 10$.
7. At what point does the line $5x + 3y = 15$ intersects the x -axis?
8. What are the coordinates of points where $2x - 7y = 14$ intersects y -axis?
9. What is the y coordinate of the point which lies on the line $3x + y = 5$ and whose x -coordinate is 1?
10. Find x -coordinate of point lying on the line $5x - y - 7 = 0$ corresponding to $y = 3$.
11. Find the coordinates of two points which lie on the line $x + 7y = 1$.
12. Find two solutions of the equation $2x + 3y = 5$.
13. If C and F denote the temperature of celcius and fahrenheit scales respectively, then the following relations holds : $C = \frac{5}{9}(F - 32)$. Find the value of C when $F = 86$.
14. What type of lines are these : $2x + 3y - 1 = 0$, $6x + 9y + 10 = 0$?
15. Give equation of a line in two variables which passes through the origin.
16. For what value of K the pair of linear equations has infinite solutions?
$$4x + y = 3$$
$$12x + 3y = 3K$$
17. How many solutions the following simultaneous linear equations have?
$$4x + 6y = 9, 2x + 3y = -11$$
18. If a system of equation is inconsistent, then what type of graph the equations will have?

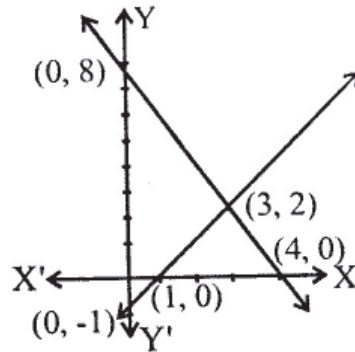
19. For what value of a , the pair of linear equations has no solution?
 $3x - 4y + 7 = 0$
 $ax + 3y - 5 = 0$
20. Form an equation of a line so that the point $x = 1, y = -2$ lies on that line?
21. The line $2x + 2 = x + 4$ is parallel to which axis?
22. At what point do the lines $x - y = 0$ and $x + y = 0$ intersect?
23. What value of p will satisfy the equation $px + 2y = 5$ when $x = 3, y = 1$?
24. Find the value of x and y from the following simultaneous linear equations.
 $x + y = 7, 5x + 12y = 7$
25. What is the value of y satisfying both the equations when $x = 1$?
 $2x - y = 3, 4x - y = 5$
26. What are the coordinates of the point of intersection of two lines
 $3x + y = 0, 5x - 2y = 0$?
27. What are the points of intersection of the line $\frac{x}{a} + \frac{y}{b} - 2 = 0$ with x -axis and with y -axis?
28. Find coordinates of two points on the line $5x + 3y = 15$ in the figure below :-



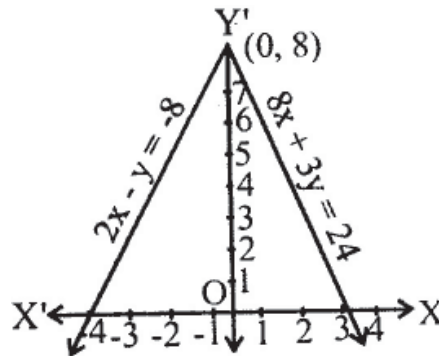
29. If $x = y, x = 2$, and x -axis from the triangle as shown in the figure below, find the coordinates of the three vertices of the triangle.



30. What is the length of base of triangle formed the lines $x - y - 1 = 0$, $2x + y = 8$ and y -axis in the figure below?



31. If speed of a boat in still water is 25km/hr and speed of stream is 5km/hr, what are the speeds of boat in upstream and downstream?
32. A person can row downstream 20km in 2 hrs. and upstream 4km in two hours. Find the speed of rowing in still water and the speed of the current?
33. What is the area of the triangle formed by the lines.
 $2x - y = -8$, $8x + 3y = 24$ and x -axis in the figure below?



34. Find the two digit number if ratio of digits is 1 : 3 and their sum is 8.
35. If ratio of three angles of a triangle is 1 : 2 : 3, what are the measures of three angles in degrees?
36. If three angles of a triangle are x , $2x$, $2x + 5$, what is the measure of each angle?
37. For rectangular plot having 72 square metre area, find the sides if length is twice the breadth?
38. If one number is thrice the other and their sum is 16, find the numbers.
39. 3 chairs and 2 tables cost Rs. 2,400. If cost of one chair is Rs. 400, what is the cost of 1 table?

40. Sum of two number is 35 and their difference is 13. Find the two numbers.
41. What should be added to 35 to obtain a number obtained by reversing digits of 35?
42. A father is 3 times as old as his son. After 12 years his age will be twice as that of the age of his son. Find their present ages.
43. In $\triangle ABC$, $\angle A = x^\circ$, $\angle B = y^\circ$ and $\angle C = y + 20^\circ$. If $y - x = 50^\circ$, what type of triangle is $\triangle ABC$?
44. Two audio cassettes and three video cassettes cost Rs. 340. But three audio cassettes and two video cassettes cost Rs. 260. Find the price of a pair of an audio and a video cassette.
45. Find the increase in area of a rectangle ($15m \times 13m$) if 7 is added to both sides of a rectangle.
46. A man rowing at the rate of 5km/hr in still water takes thrice as much time to going 40km up the stream as in going 40km down the stream. Find the rate at which the river flows?
47. The sum and difference of ages of Reema and her elder sister are 60 years and 10 years. Find their ages.
48. A number is as much greater than 15 as it is less than 25. Find the number.
49. A man has only 50 paisa coins and 25 paisa coins in his purse. If the ratio of coins is 4 : 5 and amount Rs 13 in all, how many coins of each does he have?
50. If we add 1 in the numerator of a fraction and subtract 1 from its denominator, the fraction becomes 1. If it is also given that the fraction becomes half when we add 1 to its denominator, then what is the fraction?

CHAPTER 3
Answer
(Linear Equations in Two Variables)

1. 2
2. x-axis
3. $m \neq \frac{1}{3}$
4. $y = 0$
5. (5, 0)
6. (0, -2)
7. (3, 0)
8. (0, -2)
9. $y = 2$
10. $x = 2$
11. (1, 0) (8, -1)
12. (1, 1)(4, -1)
13. 30
14. Parallel
15. $ax + by = 0$
16. $K = 3$
17. No Solution
18. Parallel lines
19. $a = -\frac{9}{4}$
20. $2x - 3y = 8$
21. y-axis
22. origin (0, 0)
23. $p = 1$
24. $x = 11, y = -4$
25. $y = -1$
26. (0, 0)
27. (2a, 0)(0, 2b)
28. (3, 0), (0, 5)
29. (0, 0), (2, 0), (2, 2)
30. 9 units
31. 20km/hr, 30km/hr
32. 6km/hr; 4km/hr
33. 28 sq. units
34. 26 or 62
35. $30^\circ, 60^\circ, 90^\circ$
36. $35^\circ, 70^\circ, 75^\circ$
37. 12m, 6m
38. 12 and 4
39. Rs. 600
40. 24, 11
41. 18
42. 36 yrs., 12 yrs.
43. Right angled triangle
44. Rs. 120
45. 245m^2
46. $2\frac{1}{2}\text{km/hr}$
47. 25 years, 35 years
48. 20
49. 50 paise coins = 16
25 paise coins = 20
50. $\frac{3}{5}$

CHAPTER-4

Quadratic Equations

1. What is the degree of the equation $x(x^2 - 3) - 5 = x^3 - 9x^2 - 8$.
2. One root of the quadratic equation $2x^2 - 3x + k = 0$ is $\frac{1}{2}$. What is the value of k?
3. What are the two roots of the equation $(x + 4)(x - 5) = 0$?
4. Find two values of x which satisfy the quadratic equation $x^2 - 64 = 0$.
5. What is the solution set of equation $3x^2 + 5x - 2 = 0$?
6. Solve the quadratic equation : $(x - 2)^2 - 25 = 0$.
7. Solve the quadratic equation : $ax^2 - 2abx = 0$.
8. Find the solutions of quadratic equation : $y^2 + 2\sqrt{3}y + 3 = 0$.
9. Find the solution set of quadratic equation : $5z^2 - 3z - 2 = 0$.
10. What is the solution set of quadratic equation $2z^2 + az - a^2 = 0$?
11. Find the value of x which satisfies the equation : $x + \frac{4}{x} = -4; x \neq 0$
12. What are the two roots of $2x^2 - 7x = 0$?
13. Find the value of discriminant in $25x^2 - 30x + 9 = 0$.
14. What are the two roots of the equation $(x + 5)^2 - 36 = 0$?
15. What is the value of D in the equation $9x^2 + 15x + 4 = 0$?
16. For what value of p the quadratic equation, $x^2 - 4x + p = 0$, will have real and distinct roots?
17. What is the quadratic equations whose roots are 3 and 4.
18. The quadratic equation $ax^2 + bx + c$ has equal roots. What are the roots?
19. Find the value of discriminant of the equation $\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$
20. For what value of p the equation $px^2 + 4x + 1 = 0$ will have equal roots?

21. What value of x will satisfy the equation $x^2 = (x + 5)(x + 3)$?
22. The length of a hall is 10m more than its breadth. Find the length and breadth of the hall if its area is 600m^2 .
23. If sum of a whole number and its reciprocal is $\frac{17}{4}$, what is the number?
24. Difference of the natural number and its reciprocal is $\frac{3}{2}$. What is the number?
25. What is the quadratic equation whose one of the roots is $3 - \sqrt{5}$?
26. Find two consecutive whole numbers, the difference of whose squares is 15.
27. What are the two value of z which satisfy the equation $z^2 + 2z - 8 = 0$?
28. What will be the value of discriminant (D) if the given quadraric equation is perfect square?
29. What is the equation whose roots are $2 + \sqrt{3}$ and $2 - \sqrt{3}$?
30. What are the nature of roots of the equation $(x - 2a)(x - 2b) = 4ab$?
31. For what value of p , the equation $4x^2 + 8x - p = 0$ will have equal roots?
32. The equation $x^2 - Kx - p = 0$ have two roots -4 and -5 . What is the value of K ?
33. If $x^2 + \frac{1}{x^2} = 2$, what are the values of x ?
34. Divide 25 into two parts such that their product is 150.
35. One side of the rectangle exceeds the other side by 3cm. If the area of rectangle is 180sq.cm. , find the two sides of the rectangle.
36. What are the value of p and q if these are the roots of the equation $x^2 + px + q = 0$?
37. If $S = \frac{n(n+1)}{2} = 78$, find n .
38. Find the roots of the equation $3x^2 + 2\sqrt{5}x - 5 = 0$.
39. Find the roots of the equation $y^2 + \frac{1}{2}y - 1 = 0$.

40. What is the value of x in $\frac{x+3}{x} = 4x$?
41. What is the value of x which satisfies the equation $\sqrt{1 + \frac{27}{169}} = 1 + \frac{x}{13}$?
42. There are three consecutive positive integers such that sum of, the square of the first and product of other two, is 29. What are the integers?
43. For what value of k will the equation $5y^2 - 20y + (k - 1) = 0$ have real and equal roots?
44. Determine the value of p for which the given quadratic equation has real roots :
 $2x^2 + 3x + p = 0$
45. The product of Ramu's age (in years) five years ago and his age (in years) nine years later is 15. Determine Ramu's present age.
46. The sum S of n successive odd natural numbers starting from 3 is given by the relation $S = n(n + 2)$. Determine n , if the sum is 168.
47. If -4 is a root of the equation $x^2 + px - 4 = 0$ and the quadratic equation $x^2 + px + k = 0$ has equal roots, find the value of k .
48. If α, β are the roots of the equation $3x^2 - 7x + 3 = 0$, then what is the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.
49. If α, β are the roots of the quadratic equation $x^2 - 2x - 8 = 0$, then what is the value of $\frac{\alpha^2}{\beta^2} + \frac{\beta^2}{\alpha^2}$.
50. If one root of the quadratic equation $x^2 - mx - 16 = 0$ is negative of other then what is the value of m ?

CHAPTER 4
Answer
(Quadratic Equations)

- | | | |
|--|--|--------------------------|
| 1. 2 | 20. 4 | 41. 1 |
| 2. -2 | | 42. 3, 4, 5 |
| 3. -4, 5 | 21. $\frac{-15}{8}$ | 43. $k = 21$ |
| 4. ± 8 | 22. 30m, 20m | 44. $p \leq \frac{9}{8}$ |
| 5. $\left\{ \frac{1}{3}, -2 \right\}$ | 23. 4 | 45. 6 years |
| 6. $x = -3, 7$ | 24. 2 | 46. $n = 12$ |
| 7. $x = 0$ or $x = 2b$ | 25. $x^2 - 6x + 4 = 0$ | 47. $\frac{9}{4}$ |
| 8. $y = -\sqrt{3}, -\sqrt{3}$ | 26. 7, 8 | 48. $\frac{-4}{3}$ |
| 9. $\left\{ 1, \frac{-2}{5} \right\}$ | 27. -4, 2 | 49. 20 |
| 10. $\left\{ -a, \frac{a}{2} \right\}$ | 28. 0 | 50. 0 |
| 11. $x = -2$ | 29. $x^2 - 4x + 1 = 0$ | |
| 12. $0, \frac{7}{2}$ | 30. real and distinct | |
| 13. 0 | 31. -4 | |
| 14. 1, -11 | 32. 9 | |
| 15. 81 | 33. ± 1 | |
| 16. $p = 4$ | 34. 15, 10 | |
| 17. $x^2 - 7x + 12 = 0$ | 35. 12cm, 15cm | |
| 18. $\frac{-b}{a}$ | 36. $p = 1, q = -2$ | |
| 19. 32 | 37. 12 | |
| | 38. $-\sqrt{5}, \frac{\sqrt{5}}{3}$ | |
| | 39. $\frac{-1 + \sqrt{17}}{4}, \frac{-1 - \sqrt{17}}{4}$ | |
| | 40. $1, \frac{-3}{4}$ | |

CHAPTER-5

Arithmetic Progression

1. Find the common difference d of the A.P. 10, 8, 6, 4, 2
2. If 7th and 6th terms of an A.P. are 25 and 32, what is the value of d ?
3. Find the 6th term of an A.P. 3, 5, 7.....
4. 1, 4, 7, 10, 13 is an A.P. Find 'd'.
5. Find the common difference of the A.P.
-1, 2, 5, 8, 11,
6. What is the common difference of the A.P. formed by even numbers?
7. Find the value of 11th term of the A.P., whose first two terms are -3 and 4.
8. If $t_n = 2n + 1$ then find the series.
9. If $a_2 = 5$ and $a_3 = 9$, then find t_5 .
10. Find the n th term of the A.P. 5, 2, -1, -4, -7,
11. What is the difference between 3rd and 8th terms of the A.P?
3, 7, 11, 15,
12. If first term of an A.P. is 3 and 11th term is 43, find the common difference.
13. If 4th and 8th terms of an A.P. are 11 and 23 respectively, find a and d .
14. First term of an A.P. is -2 and 10th term is 28. What is the value of d (common difference)
15. Find the 16th term of an A.P. if $a = 15$, and $d = -2$
16. Find 8th term of an A.P. whose 3rd term is -5 and common difference is 4.
17. Which term of an A.P. 3, 7, 11, 15, will be 20 more than its 6th term?
18. How many d 's will be added to get 29th term of an A.P. to the first term?
19. Find 4th term from the end of the A.P. -4, -1, 2, 5, 8, 11, 14, 17, 20, 54.
20. The sum of series in A.P. is 128. If the first term is 2 and the last term is 14 find the number of terms of the series.
21. Find the value of d of the A.P. whose n th term is $9 - 5n$.
22. If $a = 5$, $d = -1$, then which term of the A.P. is zero?
23. How many multiples of 4 lies between 10 and 250?
24. Find the sum of first 5 terms of the A.P. 3, 7, 11.....

25. If S_n and S_{n-1} are given, then what is $S_n - S_{n-1}$?
26. Find the 10th term of the A.P. 117, 104, 91, 78,
27. If common difference of an A.P. is 5, find the difference of 15th and 11th terms.
28. What should be added to 184 to become the term of the sequence 3, 7, 11,.....?
29. If 7th term of an A.P. is 32 and 13th term is 62. Find the series.
30. Find the number of terms of the A.P. 5, 9, 13, 17, 21, 25, 29, 41
31. Find the number of terms of the A.P. 1, 4, 7, 10, 61.
32. If Rajni goes from Rohini to Lajpat Nagar with a speed of 30km/hr by car and after every hour she increases the speed by 5km/hr., then what is the speed of car after 4 hours?
33. Find the sum of all terms of the A.P. $1 + 3 + 5 + \dots + 29$.
34. Find the sum of first 10 natural numbers.
35. What is the sum of first five multiples of 3?
36. Find the sum $2 + 6 + 10 + 14 + \dots + 34$.
37. Find the sum of $2 + 4 + 6 + \dots$ up to n terms.
38. If three consecutive terms of an A.P. are $a - d$, a , $a + d$ and their sum is 54 and d is 7, find the three terms.
39. Find the A.P. if the 15th term is 10 more than the 13th term and first term is 5.
40. Determine the sum of first 10 terms if an A.P. if $t_2 = 2$ and $t_7 = 22$.
41. Determine 'k' so that $8k + 4$, $6k - 2$, $2k - 7$ are three consecutive terms of an A.P.
42. If the sum of first 'n' term of an A.P. is $3n^2 + 2n$, then find its nth terms.
43. For the A.P. $-9, -14, -19, -24$ find $t_{30} - t_{20}$.
44. If 7th term of an A.P. is zero then what is the relation between 17th and 37th term?
45. If the 9th term of an A.P. is zero, then what is the ratio of 29th term to 19th term?
46. A man saved Rs. 16,500 in 10 years. In each year after the first he saved Rs. 100 more than he did in the preceeding year. How much did he save in the first year?
47. Find the sum of first 100 multiples of 5.
48. Find the sum of the A.P. $1 + 3 + 5 + 7 + \dots + 199$.
49. Find the value of k if the kth term of the A.P. $-1, -3, -5, -7, \dots$ is -151 .
50. The sum of n terms of a series is $(n^2 + 2n)$ for all values of n. Find the 3rd term of the series.

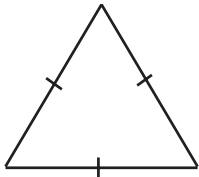
CHAPTER 5
Answer
(Arithmetic Progression)

- | | | | |
|-----|----------------|-----|------------------|
| 1. | -2 | 27. | 20 |
| 2. | -7 | 28. | 3 |
| 3. | 13 | 29. | 2, 7, 12, |
| 4. | 3 | 30. | 10 |
| 5. | 3 | 31. | 21 |
| 6. | 2 | 32. | 50km/hr. |
| 7. | 67 | 33. | 225 |
| 8. | 3, 5, 7,..... | 34. | 55 |
| 9. | 17 | 35. | 45 |
| 10. | $8 - 3n$ | 36. | 162 |
| 11. | 20 | 37. | $n(n + 1)$ |
| 12. | 4 | 38. | 11, 18, 25 |
| 13. | $a = 2, d = 3$ | 39. | 5, 10, 15, |
| 14. | $\frac{10}{3}$ | 40. | 160 |
| 15. | -15 | 41. | $\frac{1}{2}$ |
| 16. | 15 | 42. | $6n - 1$ |
| 17. | 11th | 43. | -50 |
| 18. | 28 | 44. | Thrice |
| 19. | 45 | 45. | 2 : 1 |
| 20. | 16 | 46. | Rs. 1200 |
| 21. | -5 | 47. | 25250 |
| 22. | 6 | 48. | 10,000 |
| 23. | 60 | 49. | 76 |
| 24. | 55 | 50. | 7 |
| 25. | t_n | | |
| 26. | 0 | | |

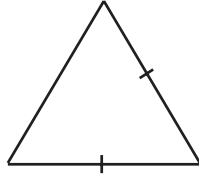
CHAPTER-6

Similar Triangles

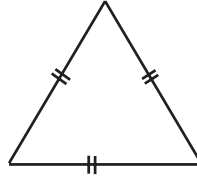
1. Select the pair of similar figures.



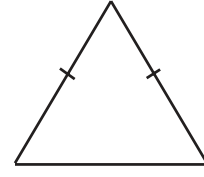
(a)



(b)

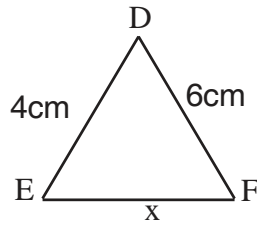
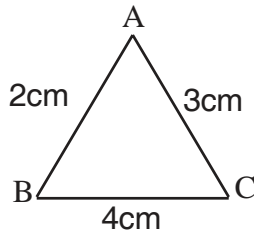


(c)

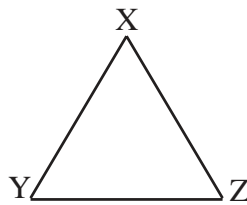
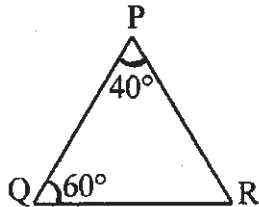


(d)

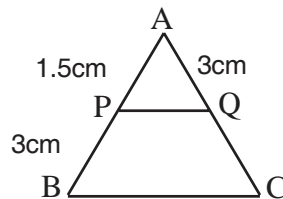
2. In figures, $\triangle ABC \sim \triangle DEF$, find the value of x .



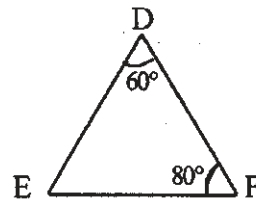
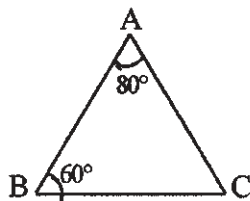
3. In figures $\triangle PQR \sim \triangle XYZ$, find the value of $\angle Y$ and $\angle Z$.



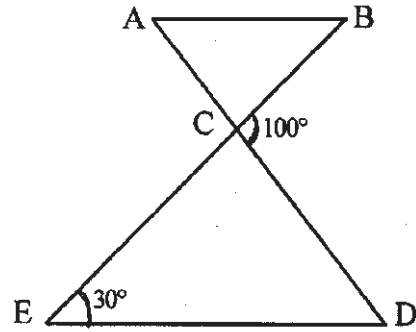
4. In $\triangle ABC$, $PQ \parallel BC$, find CQ .



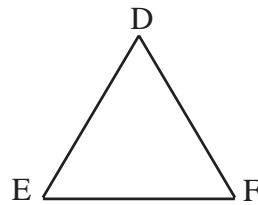
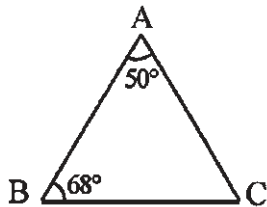
5. In figures, name the similar triangles.



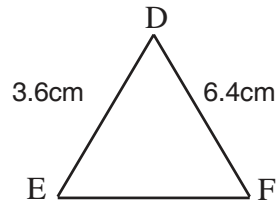
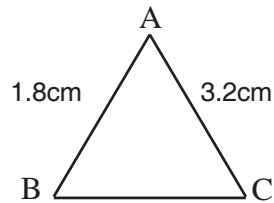
6. In figure, $\triangle ACB \sim \triangle ECD$, find $\angle B$.



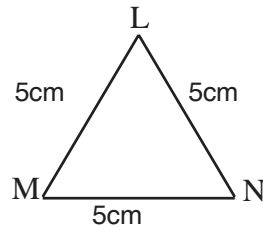
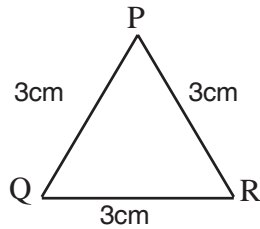
7. In figures, $\triangle ABC \sim \triangle DEF$, find $\angle F$.



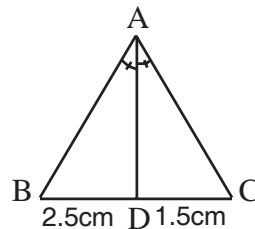
8. In figures, $\triangle ABC \sim \triangle DEF$, find $\frac{BC}{EF}$.



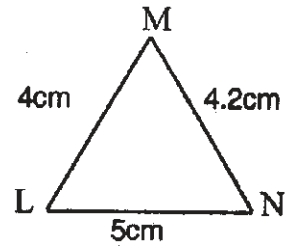
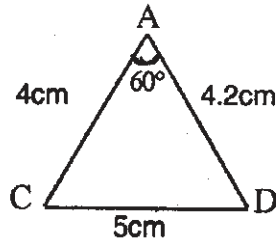
9. In figures, find $\frac{ar(\triangle PQR)}{ar(\triangle LMN)}$



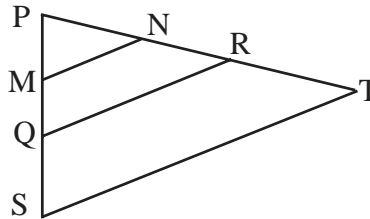
10. In figure, AD is bisector of $\angle A$, find $\frac{AB}{AC}$.



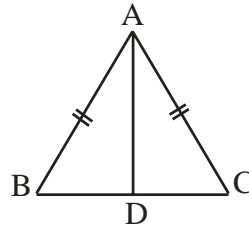
11. In figures, find $\angle M$.



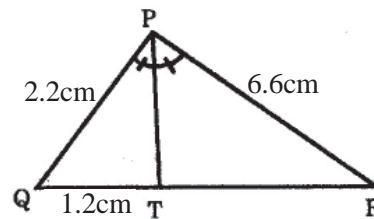
12. In figure, $\angle S = \angle PRQ$, $MN \parallel QR$. Write the names of similar triangles.



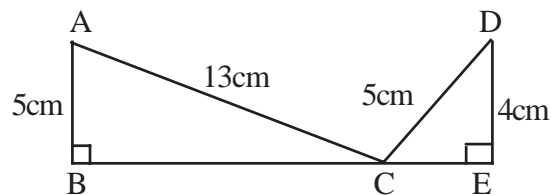
13. $\triangle BAC$ is an isosceles \triangle with $AB = AC$, AD is the bisector of $\angle BAC$. Find $\frac{BD}{DC}$.



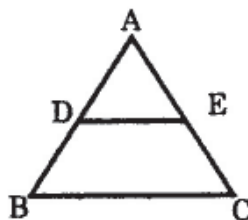
14. In figure, PT is bisector of $\angle QPR$, find TR .



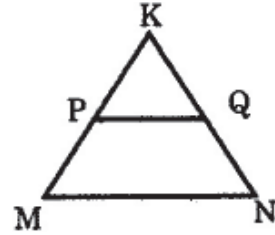
15. $\triangle ABC$ and $\triangle DEC$ are the right triangles with $\angle B = \angle E = 90^\circ$; find BE .



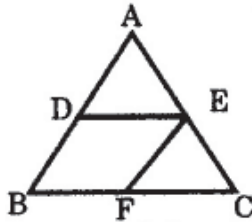
16. In $\triangle ABC$, $DE \parallel BC$ and $\frac{AD}{DB} = \frac{2}{3}$, find $AE : AC$.



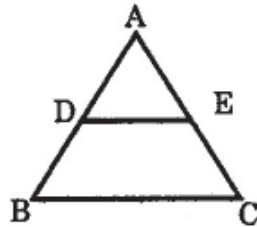
17. In figure, $PQ \parallel MN$. If $\frac{KP}{PM} = \frac{4}{13}$ and $QN = 26$, find KQ .



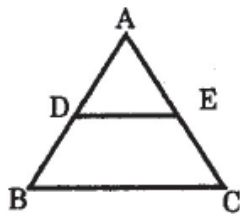
18. The perimeters of two similar triangles ABC and PQR are respectively 36cm and 24cm . If $PQ = 10\text{cm}$, find AB .
19. In figure, $AD : DB = 1 : 3$, $AE : EC = 1 : 3$ and $BF : FC = 1 : 4$, find which two lines are parallel.



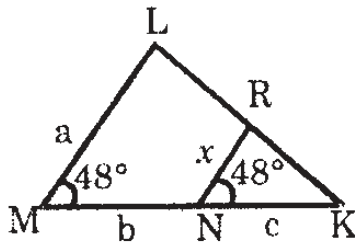
20. In figure, $DE \parallel BC$. If $AD = 5BD$ and $EC = 1.6\text{cm}$, find AE .



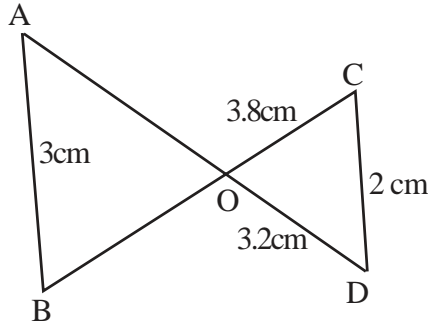
21. In $\triangle ABC$, $DE \parallel BC$. If $AD = 6\text{cm}$, $DB = 9\text{cm}$ and $AE = 8\text{cm}$, find AC .



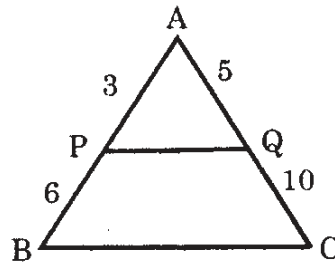
22. Express x in the terms of a , b and c in the following figure.



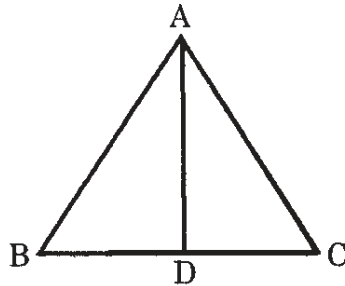
23. In figure, $\triangle ABO \sim \triangle DCO$. If $AB = 3\text{cm}$, $CD = 2\text{cm}$, $OC = 3.8\text{cm}$ and $OD = 3.2\text{cm}$, find OA .



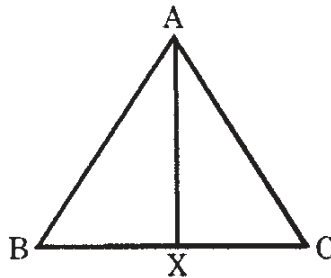
24. In figure, P and Q are points on the sides AB and AC respectively of $\triangle ABC$, If $PQ = 4\text{cm}$, find BC .



25. In figure, AD is the internal bisector of $\angle BAC$. If $AB = 6\text{cm}$, $AC = 4\text{cm}$ and $BD = 2.4\text{cm}$, find BC .



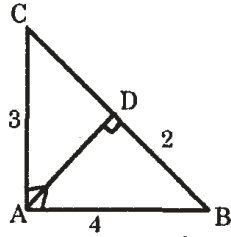
26. In figure, AX is the bisector of $\angle BAC$. If $AB = 3\text{cm}$, $AC = 4\text{cm}$ and $BC = 5\text{cm}$, find BX .



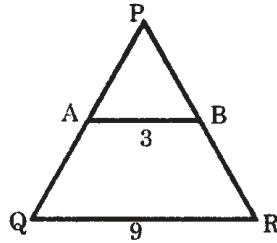
27. The lengths of sides of a triangle are 12cm , 16cm and 21cm . The bisector of the greatest angle divides the opposite side into two parts. Find the length of these two parts.
28. In a triangle, the internal bisector of angle bisect the opposite side; what type of triangle is this?
29. Two triangle ABC and DEF are similar. If $AB = 10\text{cm}$ and $DE = 8\text{cm}$, find the ratio of the areas of $\triangle ABC$ and $\triangle DEF$.

30. In figure, find AD if :-

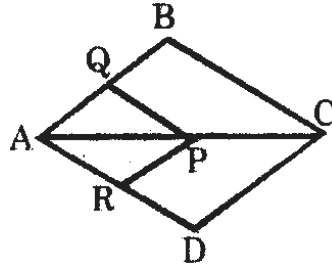
$$CAB \sim ADB$$



31. In figure, $PR = 6\text{cm}$ and $AB \parallel QR$. Find BP.

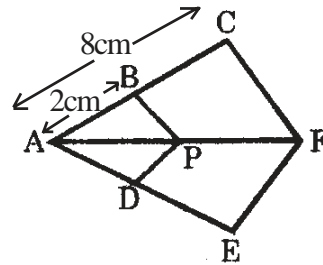


32. In figure, if $PQ \parallel BC$ and $PR \parallel CD$, $AR = 4\text{cm}$, $AD = 16\text{cm}$ and $AQ = 3\text{cm}$. Find AB.

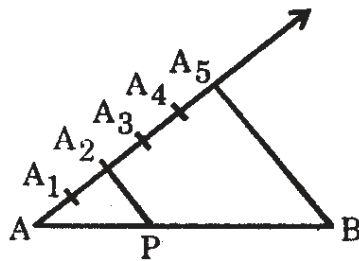


33. A ladder is placed in such a way that its foot is at a distance 5cm from the wall and its top reaches a window 12cm above the ground. Determine the length of the ladder.

34. In figure, $BP \parallel CF$, and $DP \parallel EF$, find $\frac{AD}{DE}$.

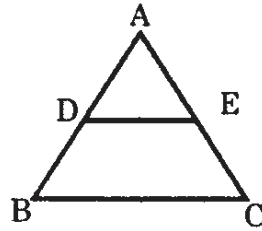


35. In figure, point P divides the line segment internally. What is the ratio PA : PB?

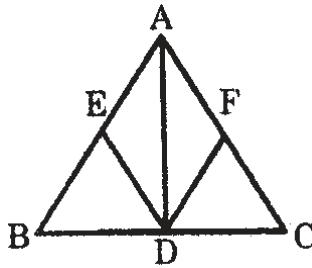


36. In a trapezium ABCD, $AB \parallel CD$ and $AB = 2CD$. The diagonals AC and BD meet at O. If the area of $\triangle AOB$ is 84 sq.cm., find the area of $\triangle COD$.

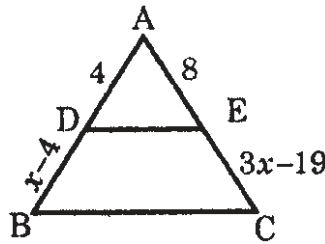
37. In figure, $DE \parallel BC$ and $AD : DB = 2 : 3$. Find $ar(\triangle ADE) : ar(\triangle ABC)$.



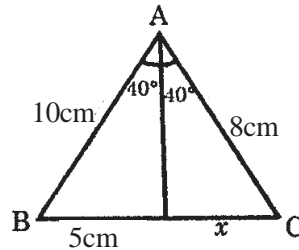
38. AD is a median of a $\triangle ABC$. DE and DF are bisectors of $\angle ADB$ and $\angle ADC$ meeting AB and AC at E and F respectively. If $AE = 3\text{cm}$, $BE = 4\text{cm}$ and $AF = 15\text{cm}$, find FC.



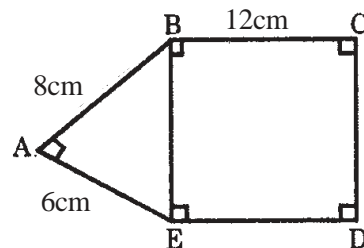
39. In figure, find x if $DE \parallel BC$.



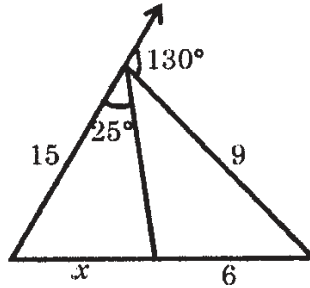
40. In figure, find the value of x .



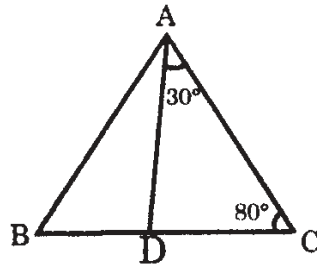
41. ABC is an isosceles triangle in which $\angle C = 90^\circ$. If $AC = 6\text{cm}$, find AB^2 .
42. In figure $AB = 8\text{cm}$, $BC = 12\text{cm}$ and $AE = 6\text{cm}$. Find area of the rectangle BCDE.



43. In an equilateral $\triangle ABC$ of side 'a', what is the height of $\triangle ABC$?
44. A boy goes 15m due east and 20m due north. How far is he from the starting point?
45. $AB=5\text{cm}$, $BC=2\text{cm}$ and $AC = \sqrt{29}$ cm are the sides of $\triangle ABC$. Then what is the measure of $\angle B$?
46. In figure, find x .



47. In figure, if $\frac{AB}{AC} = \frac{BD}{CD}$, then find $\angle ABD$.



48. If $\triangle ABC \sim \triangle DEF$, $ar(\triangle DEF) = 100\text{cm}^2$ and $\frac{AB}{DE} = \frac{1}{2}$, then find the area of $\triangle ABC$.
49. In a rhombus ABCD with side 4cm, AC and BD are diagonals bisecting at O. Find the value of $AC^2 + BD^2$.
50. The corresponding altitude of two similar triangles are 7cm and 8cm respectively. Find the ratio of their areas.

CHAPTER 6
Answer
(Similar Triangles)

1. (a) and (c)
2. 8cm
3. $\angle Y = 60^\circ, \angle Z = 80^\circ$
4. 6cm
5. $\triangle ABC \sim \triangle FDE$
6. 70°
7. 62°
8. $\frac{1}{2}$
9. $\frac{9}{25}$
10. $\frac{5}{3}$
11. 60°
12. $\triangle PQR \sim \triangle PTS, \quad PMN$
13. 1
14. 3.6cm
15. 15cm
16. 2 : 5
17. 8
18. 15cm
19. $DE \parallel BC$
20. 8cm
21. 20cm
22. $\frac{ac}{b+c}$
23. 4.8cm
24. 12 cm
25. 4cm
26. $\frac{15}{7}$
27. 9cm, 12cm
28. Isosceles
29. $\frac{25}{16}$
30. 1.5cm
31. 2cm
32. 12cm
33. 13cm
34. 1 : 3
35. 2 : 3
36. 21 sq.cm.
37. 4 : 25
38. 20cm
39. $x = 11$
40. 4cm
41. 72cm
42. 120cm^2
43. $\frac{\sqrt{3}}{2}a$
44. 25cm
45. 90°
46. 10cm
47. 40°
48. 25cm^2
49. 64cm
50. 49 : 64

Chapter - 7

CO-ORDINATE GEOMETRY

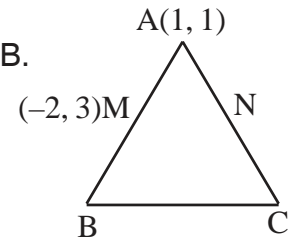
1. In which quadrant does the point $(-10, 2)$ lie?
2. $(0, 2)$ and $(0, -5)$ are the co-ordinate of two points lying on _____ axis.
3. Find the distance of a point $P(x, y)$ from the origin $(0, 0)$.
4. What are the coordinates of mid-point of line joining the points $(6, -2)$ and $(4, 8)$?
5. What are the coordinate of centroid of triangle formed by the points $(-7, 6)$, $(8, 5)$, $(2, -2)$?
6. What is the x - coordinate of the point which divides the line joining $(1, 2)$ and $(2, 3)$ in the ratio $4 : 3$?
7. Find the coordinates of points which divides line joining $(-4, 0)$ and $(0, 6)$ in the ratio $1 : 3$.
8. Find the third vertex of a triangle if two of its vertices are $(-1, 4)$ and $(5, 2)$ and centroid is $(0, -3)$.
9. What is the length of the line AB, where A $(1, 0)$ and B $(5, 3)$.
10. Find the length of the line AB, where coordinates of points A and B are $(2, 7)$ and $(-2, 4)$.
11. What is the distance of the point $(8, -2)$ from the origin?
12. Find the centroid of a triangle whose vertices are $(-2, -3)$, $(-1, 0)$ and $(7, -6)$
13. What is distance between points $(-3, 2)$ and $(1, -2)$?
14. What is the area of triangle ABC, whose vertices are $A(x_1, y_1)$, $B(x_2, y_2)$ and $C(x_3, y_3)$
15. Find the coordinates of points dividing the points $(3, 5)$ and $(7, 9)$ in the ratio $2 : 3$.
16. Find the distance of the point $(0, 2)$ from the mid-point of the line joining $(4, 10)$ and $(2, 2)$.
17. Point Q lies on the line joining origin and P in such a way that $OP = OQ$. What will be the co-ordinates of Q, if coordinates of P are $(-3, 2)$.
18. If AB is the line joining $(0, 1)$ and $(4, -2)$ and CD is the line joining $(1, 2)$ and $(6, 4)$, then what is $CD^2 - AB^2$?

19. Find the ratio in which the line segment joining $(-2, -3)$ and $(5, 6)$ is divided by x-axis.
20. Find the sum of lengths of the diagonals AC and BD of quadrilateral ABCD if $A(3, 0)$, $B(5, 3)$, $C(0, 7)$ and $D(-2, 0)$.
21. Find the sum of lengths of AB and BC if the coordinates of A, B and C are $(1, 2)$, $(-2, -2)$ and $(4, 6)$ respectively.
22. Find the value of k if the point $(0, 3)$ is equidistant from $(5, k)$ and (k, k) .
23. What is the distance between the points $(-2, 4)$ and $(-4, 3)$?
24. What is the area of triangle formed by the points $(3, 0)$, $(0, 4)$, and $(0, 0)$?
25. Find the coordinates of a point, which is at a distance of 13 units from the origin and lies on x-axis.
26. One end of a diameter of a circle is $(2, 3)$ and the centre is $(-2, 5)$. What are the coordinates of the other end of his diameter?
27. Find the length of median AD of the triangle formed by the points $A(0,6)$, $B(8, 0)$ and $C(4, 2)$.
28. Gunjan walks 12m due east and then 5m due north. At what distance is Gunjan from the starting point?
29. The base BC of an equilateral triangle ABC with side 10cm lies along x-axis such that the mid-point of the base is at the origin. Find the coordinates of point B.
30. Find the coordinates of fourth vertex of the rectangle formed by the points $(0, 0)$, $(2, 0)$ and $(0, 3)$.
31. Find the value of x such that Q is the mid-point of PR and coordinates of P, Q and R are $(6, -2)$, $(1, 3)$ and $(x, 8)$ respectively.
32. The line segment joining the points $(3, -4)$ and $(1, 2)$ is trisected at the points P and Q. Find the coordinates of P.
33. Find the value of y if the points $A(5, y)$, $B(1, 5)$, $C(2, 1)$ and $D(6, 2)$ are the vertices of the square.
34. $A(3, 2)$ and $B(-2, 1)$ are two vertices of a $\triangle ABC$ whose centroid G has coordinates $\left(\frac{5}{3}, \frac{-1}{3}\right)$. Find the coordinates of the third vertex C of the triangle.
35. What is the area of $\triangle ABC$ if points A, B and C are collinear?
36. Find the ratio in which the line-segments joining the points $(6, 4)$ and $(1, -7)$ is divided

internally by the axis of x .

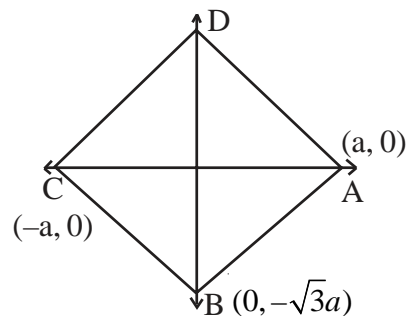
37. The three vertices of a rhombus taken in order are $(-2, -1)$, $(3, 4)$ and $(-2, 3)$. Find the fourth vertex.
38. Find the third vertex of a triangle, if two of its vertices are $(-3, 1)$ and $(0, -2)$ the centroid is at origin.
39. The mid-point of the line segment joining $(3p, 4)$ and $(-2, 2q)$ is $(2, 6)$. Find the value of p .
40. In which ratio is the line joining the points $A(-4, 4)$ and $B(7, 7)$ divided by $(0, -1)$?
41. P is the point of x -axis such that its distance from the origin is 3 units. Find the point Q on y -axis such that $OP = OQ$.
42. The line segment joining the points $(-4, 0)$ and $(0, 6)$ is divided into four equal parts at P, Q and R . Find the coordinates of Q .

43. In the figure, M is the mid-point of AB . Find the coordinates of B .



44. Find the value of k if the distance between $(k, 5)$ and $(4, 5)$ is 5.
45. The points $(0, -1)$, $(2, 1)$, $(0, 3)$ and $(-2, 1)$ are the corners of a square. Find the length of its side.
46. If (p, q) is the mid-point of $(5, 3)$ and $(-2, -4)$ find the value of $p + q$.

47. In the figure $ABCD$, is a rhombus. Find the coordinates of the point D .



48. Find the coordinates of the fourth point B such that $OABC$ forms a square and coordinates of O, A and C being $(0, 0)$, $(3, 0)$ and $(0, 3)$.
49. If two adjacent vertices of parallelogram are $(3, 2)$, $(-1, 0)$ and the diagonals cut at $(2, -5)$ find the coordinates of other vertices of the parallelogram.
50. Find the coordinates of a point on x -axis which is equidistant from $(-2, 5)$ and $(2, -3)$.

Chapter - 7
Answers
CO-ORDINATE GEOMETRY

- | | | | |
|-----|---|-----|--------------------------------|
| 1. | 2nd Quad. | 17. | externally (3, -2), (-3, 2) |
| 2. | y | 18. | 36 |
| 3. | $\sqrt{x^2 - y^2}$ | 19. | 1 : 2 |
| 4. | (5, 3) | 20. | $2\sqrt{58}$ |
| 5. | (1, 3) | 21. | 15 |
| 6. | $\frac{11}{7}$ | 22. | 5 |
| 7. | (-3, 1.5) | 23. | $\sqrt{5}$ |
| 8. | (-4, -15) | 24. | 6sq. units |
| 9. | 5 | 25. | (13, 0) or (-13, 0) |
| 10. | 5 | 26. | (-6, 7) |
| 11. | $\sqrt{68}$ | 27. | $\sqrt{61}$ |
| 12. | $\left(\frac{4}{3}, -3\right)$ | 28. | 13m |
| 13. | $4\sqrt{2}$ | 29. | (-5, 0) |
| 14. | $\frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$ | 30. | (2, 3) |
| 15. | $\left(\frac{23}{5}, \frac{33}{5}\right)$ | 31. | -4 |
| 16. | 5 | 32. | $\left(\frac{7}{3}, -2\right)$ |
| | | 33. | 6 |
| | | 34. | (4, -4) |

35. zero
36. $\frac{4}{7}$
37. $(-7, -2)$
38. $(3, 1)$
39. 2
40. $\frac{4}{7}$
41. $(0, 3)$ or $(0, -3)$
42. $(-2, 3)$
43. $(-5, 5)$
44. 9 or (-1)
45. $\sqrt{8}$
46. 1
47. $(0, \sqrt{3}a)$
48. $(3, 3)$
49. $(1, -12), (5, -10)$
50. $(-2, 0)$

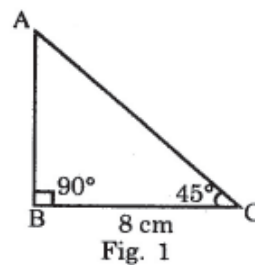
Chapter - 8

TRIGONOMETRY

1. If $x = \sin^2 \theta$ and $y = \cos^2 \theta + 1$, then find the value of $x+y$.
2. If $\sec^2 \theta(1 + \sin \theta)(1 - \sin \theta) = k$, then find the value of k .
3. Find the value of $\sin 20^\circ \sin 70^\circ - \cos 20^\circ \cos 70^\circ$
4. If $\tan \theta \tan 45^\circ = 1$, then find the value of θ
5. Find the value of $\sin^2 10^\circ + \sin^2 80^\circ$
6. If $\cos A = \frac{3}{5}$, then find the value of $\tan^2 A - \sec^2 A$.
7. If $\sin 2A = \cos 3A$, then find the value of A .
8. If $\tan \theta \tan(90^\circ - \theta) = 0$, then find the value of θ
9. Complete the following:-

The angle nearer to altitude is _____ than the angle away from the altitude.

10. In the figure, find the area of $\triangle ABC$ in which $\angle ACB = 45^\circ$ and $BC = 8\text{cm}$.



11. Name the angle of depression in the figure.

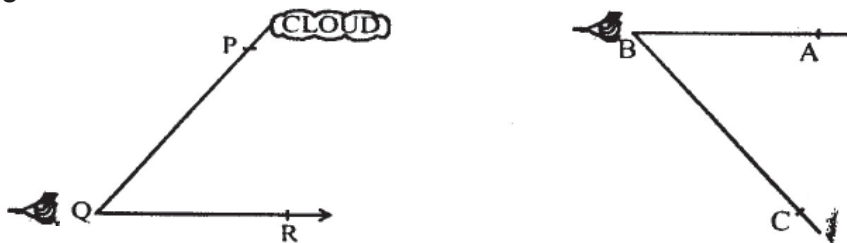


Fig. 2

12. If $x = 3\sec^2 \theta - 1$ and $y = 3\tan^2 \theta - 2$ then find the value of $x - y$.
13. If $2x = \operatorname{cosec} \theta$ and $\frac{2}{x} = \cot \theta$, then find the value of $4\left(x^2 - \frac{1}{x^2}\right)$
14. If $\sin \theta = \frac{3}{5}$, then find the value of $5\cos \theta \times \sin \theta$
15. If $\tan \theta = \frac{12}{5}$ then find the value of $\frac{13\sin \theta}{3}$
16. Find the value of $\frac{\operatorname{cosec} 39^\circ}{\sec 51^\circ} + 2(\sin^2 5^\circ + \sin^2 85^\circ)$
17. Find the value of $\cos^2 15^\circ + \cos^2 25^\circ + \cos^2 65^\circ + \cos^2 75^\circ$
18. Find the value of $\sin^2 10^\circ + \sin^2 80^\circ$
19. Find the value of $\cos^2 67^\circ - \sin^2 23^\circ$
20. Find the value of
 $\tan 10^\circ \tan 20^\circ \tan 70^\circ \tan 80^\circ$
21. Find the value of
 $\operatorname{cosec} A \sec(90^\circ - A) - \cot A \tan(90^\circ - A)$
22. Find the value of $\frac{\sin \theta - \sin^3 \theta}{\cos \theta - \cos^3 \theta}$
23. If $\tan \alpha = \frac{1}{\sqrt{3}}$ and $\sin \beta = \frac{1}{\sqrt{2}}$, find the value of $\alpha + \beta$.
24. If $\operatorname{cosec} \theta = 2$ and $\cot \theta = \sqrt{3}k$, then find the value of k .
25. If $\operatorname{cosec}^2 \theta = \frac{3}{2}$, then find the value of $2(\operatorname{cosec}^2 \theta + \cot^2 \theta)$.
26. If $\tan \theta = 4$, then find the value of $\frac{1}{10}(\tan^2 \theta + 2\sec^2 \theta)$

27. If $\sin \theta = \frac{1}{3}$, then find the value of $2 \operatorname{cosec}^2 \theta + \cot^2 \theta + 1$.
28. If $\cos \theta = \frac{3}{2}$, then find the value of $8 \sec^2 \theta + \tan^2 \theta + 1$.
29. If $1 + 2 \sin^2 \theta \cos^2 \theta = \sin^2 \theta + \cos^2 \theta + 4k \sin^2 \theta \cos^2 \theta$, then find the value of k .
30. If $\frac{\cos^2 20^\circ}{2(\sin^2 59^\circ - \sin^2 31^\circ)} = \frac{\cos^2 70^\circ}{k}$, then find the value of k .
31. Find the value of $\tan 5^\circ \times \tan 30^\circ \times 4 \tan 85^\circ$
32. If $\frac{\cos 20^\circ}{\sin 70^\circ} = \frac{2 \cos}{\sin(90^\circ - \theta)} = \frac{k}{2}$, then find the value of k .
33. If $\tan 4\theta = \cot \theta$, where 4θ and θ are acute angles, then find the value of θ .
34. If $\cos(81^\circ + \theta) = \sin\left(\frac{k}{3} - \theta\right)$, then find the value of k .
35. If $\operatorname{Sec} A = \frac{3}{2}$, then find the value of $\tan^2 A$.
36. If $\cos 3\theta = 1$, then find the value of θ .
37. If, A , B and C are the angles of a triangle, then find the value of $\tan\left(\frac{A+B}{2}\right)$ in terms of angle C .

38. If $\sin 3\theta = \cos 4\theta$, then find the value of 7θ .

39. In Fig. 3 ABCD is a rectangle, find AE.

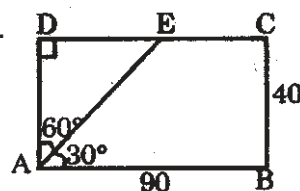


Fig. 3

40. In Fig. 4 find the value of CF.

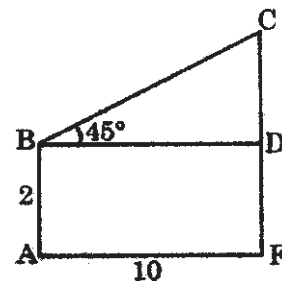


Fig. 4

41. In Fig. 5, find the value of $AP + AD$.

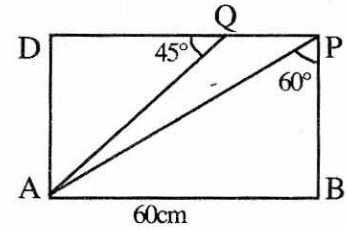


Fig. 5

42. At a point 30m. away from the foot of a tower the angle of elevation of the top of the tower is 60° . Find the height of the tower.

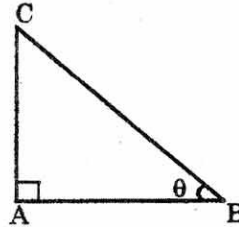


Fig. 6

43. In Fig. 6, $AB = \sqrt{3}AC$ find θ .

44. A person standing on the bank of a river observe that the angle of elevation of tree is 60° . When he moves 40m away, the angle of elevation becomes 30° . At what distance is he now standing away from tree?

45. In Fig. 7 find PR.

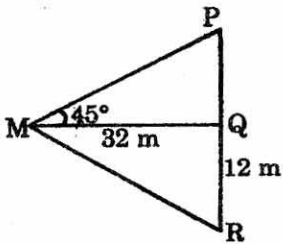


Fig. 7

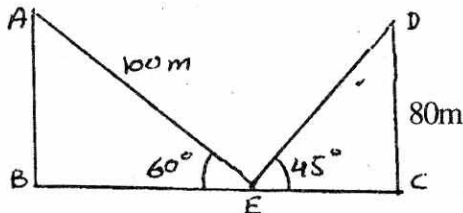


Fig. 8

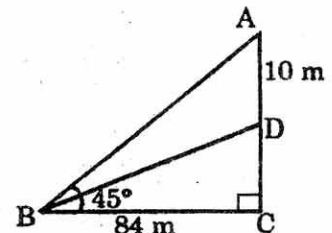


Fig. 9

46. In Fig. 8, find BC.

47. In Fig. 9, find the value of DC.

48. In Fig. 10 two men are on the opposite sides of a tower. If the height of the tower is 60m. Find the distance between them.

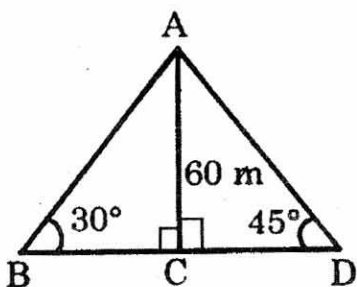


Fig. 10

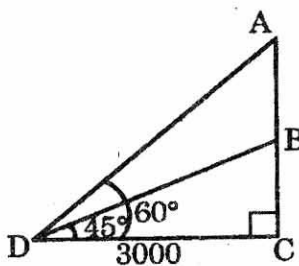


Fig. 11

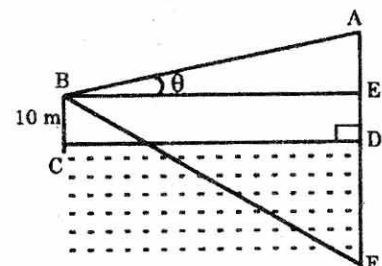


Fig. 12

49. In Fig. 11, find the value of AB.

50. In Fig. 12, DF is the reflection of building AD in the water. If $BC = 10\text{m}$ and $AE = 12\text{m}$. find DF.

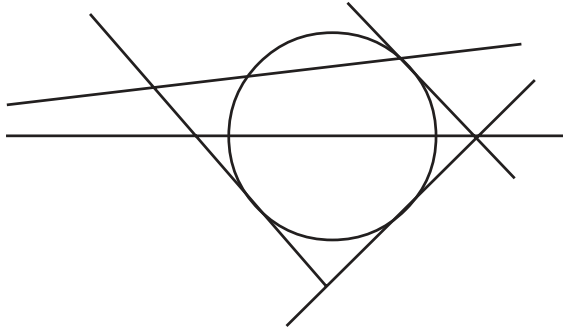
Chapter - 8
Answer
TRIGONOMETRY

- | | | | | | |
|-----|-----------------|-----|----------------------|-----|--------------------|
| 1. | 2 | 20. | 1 | 37. | $\cot \frac{C}{2}$ |
| 2. | 1 | 21. | 1 | 38. | 90° |
| 3. | 0 | 22. | $\cot \theta$ | 39. | 80 |
| 4. | 45° | 23. | 75° | 40. | 12 |
| 5. | 1 | 24. | 1 | 41. | $60\sqrt{3}$ cm |
| 6. | -1 | 25. | 4 | 42. | $30\sqrt{3}$ |
| 7. | 18 | 26. | 5 | 43. | 30° |
| 8. | 45° | 27. | 27 | 44. | 60m |
| 9. | greater | 28. | 4 | 45. | 44m |
| 10. | 32cm^2 | 29. | $\frac{1}{2}$ | 46. | 130m |
| 11. | $\angle ABC$ | 30. | 4 | 47. | 74m |
| 12. | 4 | 31. | $\frac{4}{\sqrt{3}}$ | 48. | $60 + 60\sqrt{3}$ |
| 13. | 1 | 32. | 6 | 49. | $3000(\sqrt{3}-1)$ |
| 14. | $\frac{12}{5}$ | 33. | 18° | 50. | 22m |
| 15. | 4 | 34. | 27 | | |
| 16. | 3 | 35. | $\frac{5}{4}$ | | |
| 17. | 2 | 36. | 0° | | |
| 18. | 1 | | | | |
| 19. | 0 | | | | |

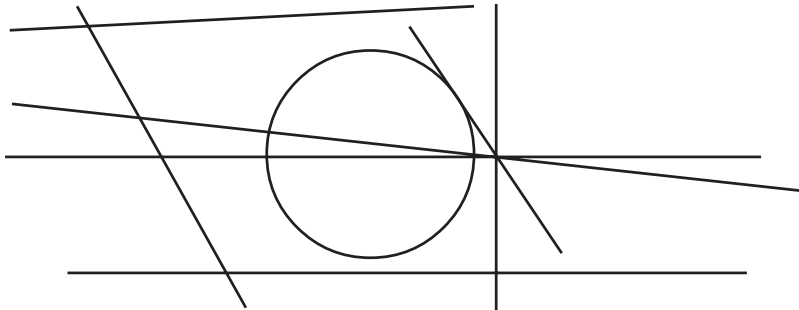
Chapter - 9

CIRCLES

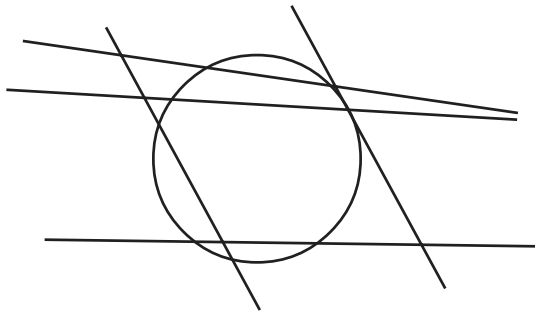
1. Count the number of tangents in the given figure.



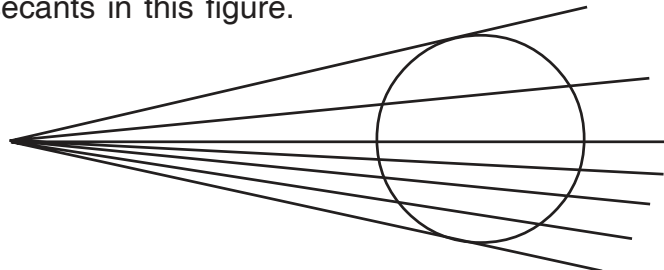
2. How many lines in this figure are not cutting the circle at all?



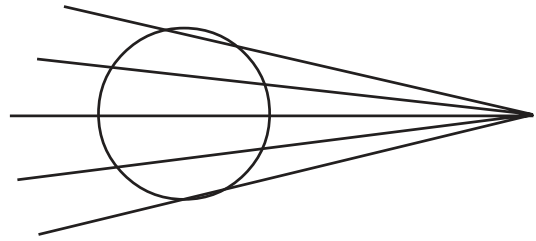
3. How many tangents are there in all in this figure?



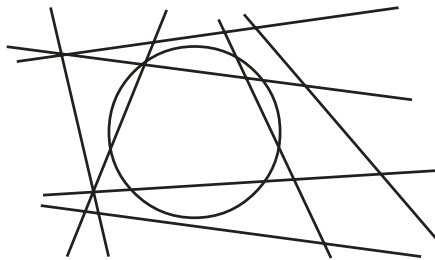
4. Count number of secants in this figure.



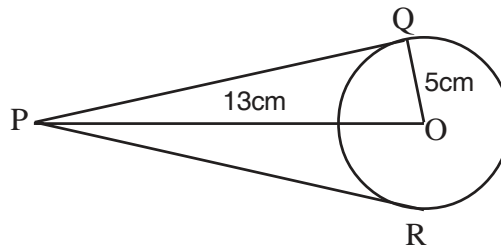
5. How many tangents are there in this figure?



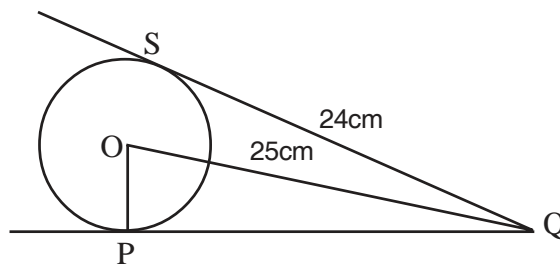
6. How many lines in this figure are touching the circle?



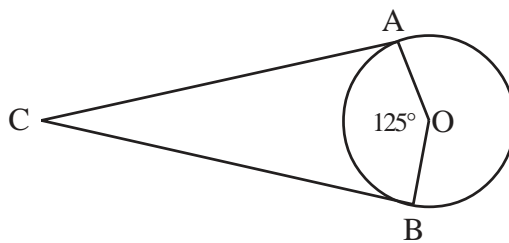
7. Find PR in the given figure.



8. Find OP.



9. Find $\angle ACB$



10. If $\angle LOM = 105^\circ$. What is $\angle OLN$.

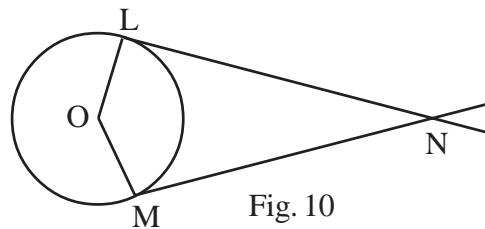
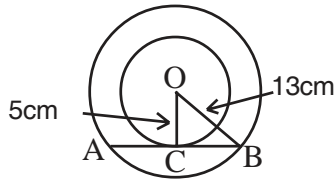


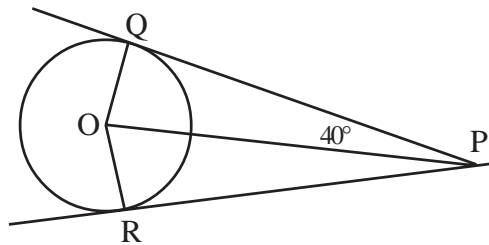
Fig. 10

11. Find $\angle LNM$ in figure 10.

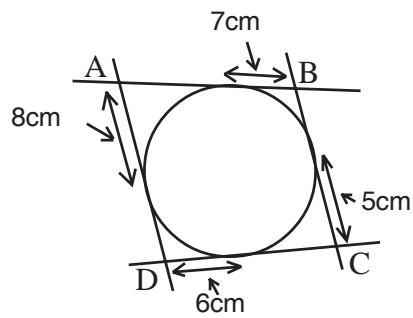
12. Find AB .



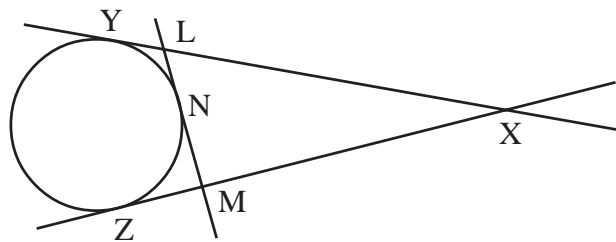
13. Find $\angle QOP$



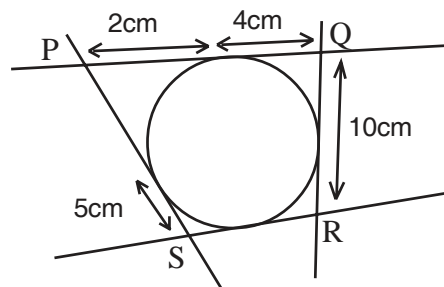
14. Find the perimeter of the quadrilateral ABCD.



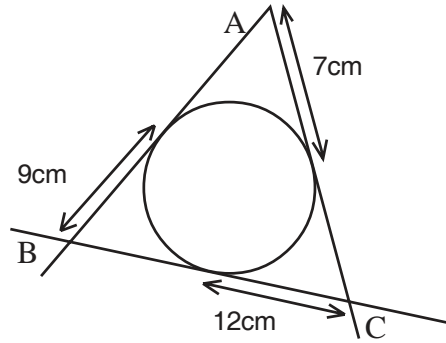
15. In the figure if $XY=20\text{cm}$., find perimeter of $\triangle XLM$



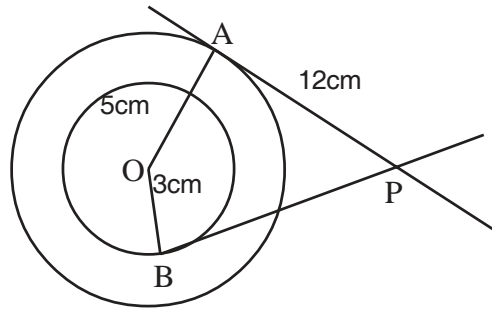
16. Find perimeter of quadrilateral PQRS.



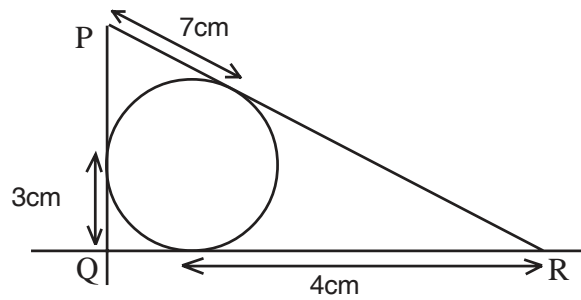
17. Find perimeter of triangle ABC.



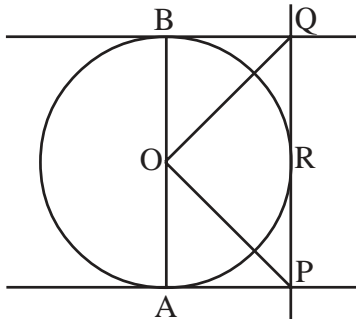
18. Find BP.



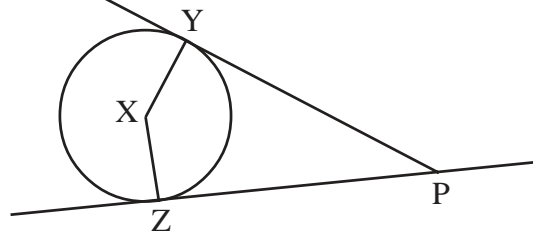
19. Find perimeter of $\triangle PQR$



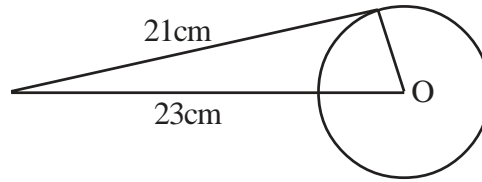
20. BQ, AP and QP are tangents to circle with centre O. Find $\angle QOP$?



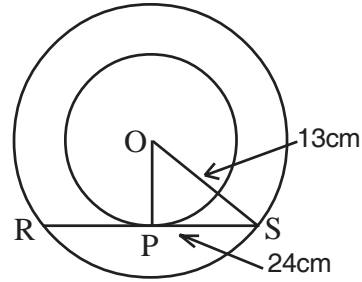
21. What is the similarity between quadrilateral PZXY and a cyclic quadrilateral?



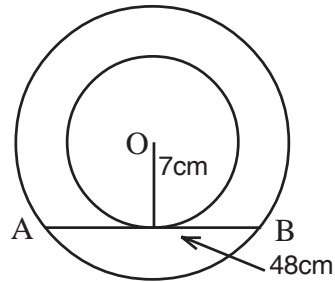
22. Find radius of the circle.



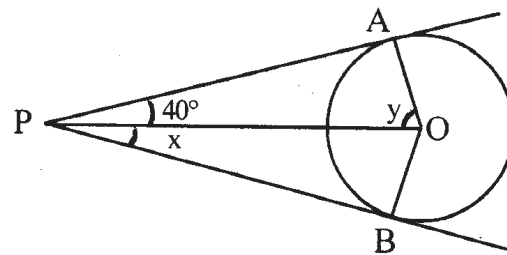
23. Find OP when RS = 24cm.



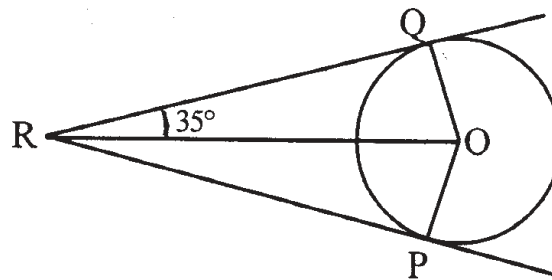
24. Find OB when AB = 48cm.



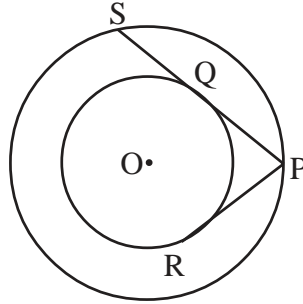
25. Find x and y.



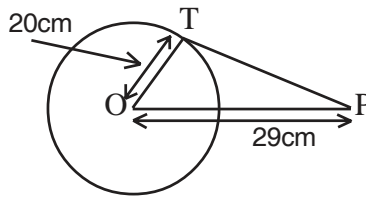
26. Find $\angle QOP$



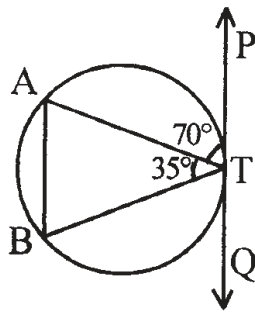
27. If $PR=7.5\text{cm}$, find PS .



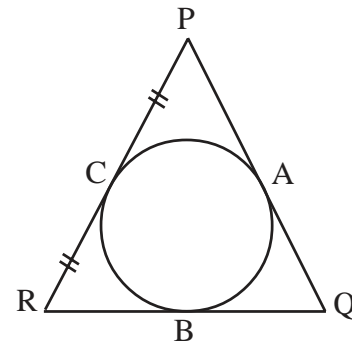
28. In figure, A point P is 29cm away from the centre of a circle. Find the length of tangent drawn from P to the circle whose radius is 20cm.



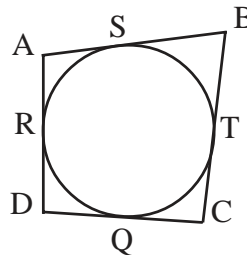
29. Find $\angle BTQ$



30. In figure, if $PC=CR$, then which two sides of a triangle are equal.

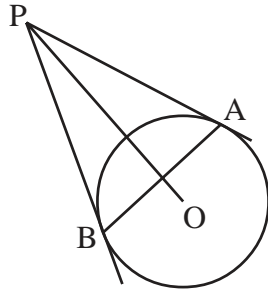


31. In figure, a circle touches all the four sides of a quad. ABCD; then which side of the quad, is equal to $(AR+BT)$?

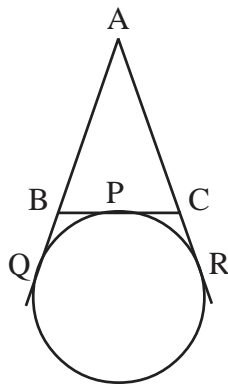


32. Find the distance between two parallel tangents to a circle whose radius is 5.5cm.

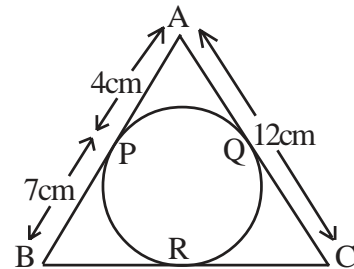
33. In figure, PA and PB are two tangents drawn from a point P to a circle with centre O touching it at A and B. Then complete the statement : OP is the _____ of AB.



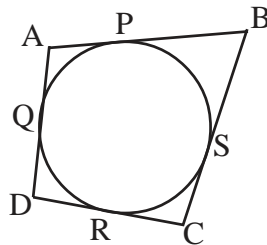
34. In figure, $\triangle ABC$ touches a circle at a point P. If we extend the sides AB and AC, they touch the circle at Q and R respectively. If the perimeter of a triangle is 12cm, find AQ.



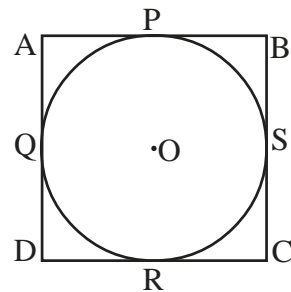
35. Find BC in the given figure.



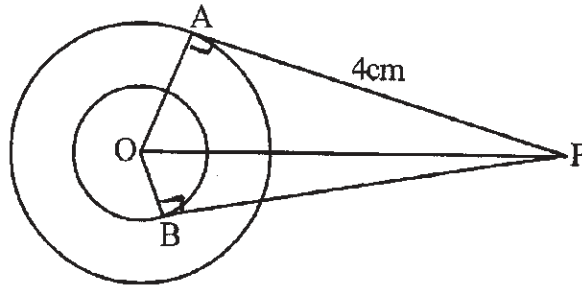
36. In the figure, the sides of a quad. ABCD touch a circle at P, Q, R and S. Then what is (AB+CD) equal to?



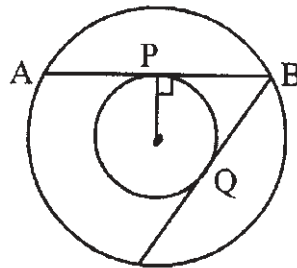
37. In the given figure if $AB = 11.5\text{cm}$ and $DC = 10.5\text{cm}$ find $AD+BC$.



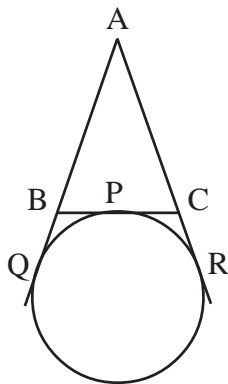
38 . In figure $AP = 4\text{cm}$, $OA = 3\text{cm}$, $OB = 2\text{cm}$. Find BP .



39. In fig. a chord AB of the larger of the two concentric circles is tangent to the smaller circle at P . If $AP = 4.5\text{cm}$. Find BQ .



40. In figure, if $AQ = 5\text{cm}$, find the perimeter of $\triangle ABC$



Chapter - 9

Answer

CIRCLES

1. 3
2. 5
3. 1
4. 5
5. 1
6. 0
7. 12cm
8. 7cm
9. 55°
10. 90°
11. 75°
12. 24cm
13. 50°
14. 52cm
15. 40cm
16. 34cm
17. 56cm
18. $4\sqrt{10}$ cm
19. 28cm
20. 90°
21. sum of opposite angles is 180°
22. $\sqrt{88}$
23. 5cm
24. 25cm
25. $x = 40^\circ, y = 50^\circ$
26. 110°
27. 15cm
28. 21cm
29. 75°
30. PQ = QR
31. AB
32. 11cm.
33. Perpendicular bisector
34. 6cm
35. 15cm.
36. AD+BC
37. 22cm.
38. $\sqrt{21}$ cm
39. 4.5cm
40. 10cm

Chapter - 10

CONSTRUCTIONS

1. If for a circle of radius 7cm, a tangent is to be made at a point 25cm away from the centre of the circle, without measuring. What will be the length of the tangent?
2. In constructing $A'BC' \sim ABC$ such that $BC' = \frac{5}{2}BC$, into how many equal parts is BC divided?
3. If a line $AB = 7\text{cm}$ is divided in ratio 3 : 4 by a point P, find BP.
4. For dividing line PQ in ratio 4 : 7 in how many minimum points will the parallel lines at P and Q be divided into.
5. For dividing a line LM in ratio 5 : 3 into how many parts the arm of acute angle be divided.
6. A $PQ'R' \sim PQR$ is to be constructed to get $\frac{PQ'}{PQ} = \frac{5}{2}$. If $PQ = 6\text{cm}$, What will be PQ' ?
7. A $LM'N' \sim LMN$ is to be made such that $\frac{LM'}{LM} = \frac{4}{3}$. If $LM' = 4.8\text{cm}$. find LM.
8. In a $\Delta PQR \sim \Delta P'QR'$ such that $\frac{P'Q}{PQ} = \frac{1}{2}$. If $QR=6\text{cm}$, what is QR' ?
9. If a point L is to be located on line YZ such that $LY : LZ = 2 : 3$. If $YZ = 15\text{cm}$, what is LZ?
10. $ABC \sim A'B'C'$ such that $B'C' = \frac{4}{5}BC$. Into how many equal parts does the side BC be divided?
11. $ABC \sim A'B'C'$ such that $\frac{AB}{A'B'} = \frac{2}{7}$, if $BC = 9\text{cm}$ what will be $B'C'$.

12. $\triangle PQR \sim \triangle PQR$ with $\frac{PQ}{PQ} = \frac{3}{5}$ if $QR = 15\text{cm}$, what will be QR ?
13. If a tangent 8cm long is drawn to a circle of radius 6cm. What will be the distance of the point from the centre?
14. If a line $AB = 24\text{cm}$ is divided in the ratio 5 : 3 by the point P. What is AP equal to?
15. If a point is to be located on a line AB such that $AP = 4.5\text{cm}$ and $AP : PB = 3 : 2$. What is the length of AB?

Chapter - 10

Answer

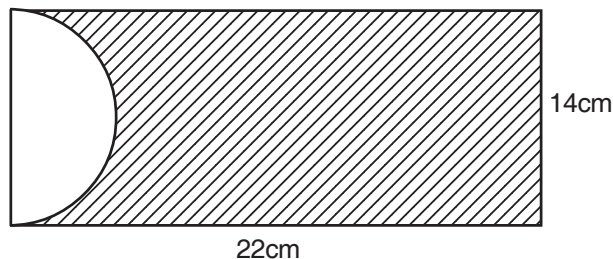
CONSTRUCTIONS

- | | |
|----------|------------|
| 1. 24cm | 9. 9cm |
| 2. 2 | 10. five |
| 3. 4cm | 11. 31.5cm |
| 4. 11 | 12. 25cm |
| 5. 8 | 13. 10cm |
| 6. 15cm | 14. 15cm |
| 7. 3.6cm | 15. 7.5cm |
| 8. 3cm | |

Chapter - 11

AREAS RELATED TO CIRCLE

1. Find the area of circle whose diameter is 'd'.
2. What is the area of a sector of a circle of radius r and central angle θ ?
3. If the circumference and area of a circle are numerically equal then what is the radius of the circle equal to?
4. Two circles having circumference C_1 & C_2 having radius R_1 & R_2 respectively. The circumference C of the third circle of radius R is such that $C = C_1 + C_2$ then what is $R_1 + R_2$ equal to?
5. The radius of circle is 3.5cm. What is the perimeter of the semicircle? ($\Pi = \frac{22}{7}$)
6. The archery target has three concentric circular regions. The diameter of the regions are in the 1 : 2 : 3. What is the ratio of their areas?
7. The radius of two circles are 13cm and 6cm respectively. What is the radius of the circle which has circumference equal to the sum of the circumference of two circles?
8. The cost of fencing a circular field at the rate of Rs. 10 per meter is Rs. 440. What is the radius of the circular field? ($\Pi = \frac{22}{7}$)
9. Find the perimeter of the protactor if its diameter is 14cm. ($\Pi = \frac{22}{7}$)
10. In the figure, a shaded portion is cut off. Find the area of the remaining portion. ($\Pi = \frac{22}{7}$)



11. The numerical difference between circumference and diameter is 30cm. What is radius

of the circle? ($\Pi = \frac{22}{7}$)

12. A bicycle wheel makes 10 revolutions in moving 880m. Find the diameter of the wheel.

($\Pi = \frac{22}{7}$)

13. A wire is in the form of circle of radius 42cm. It is bent into a square. Determine the side

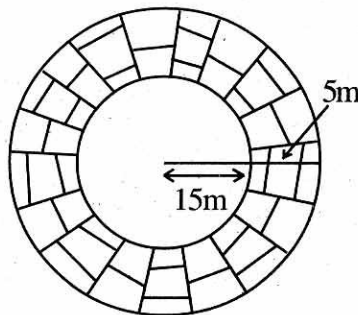
of the square. ($\Pi = \frac{22}{7}$)

14. Find the area of ring if the radius of the smaller circle is 6cm and radius of the bigger circle is 13cm.

15. Find the area of circular path of uniform width h surrounding a circular region of radius r.

16. A path of 5m is build round the circular park of radius 15m. Find the area of the path.

($\Pi = \frac{22}{7}$)

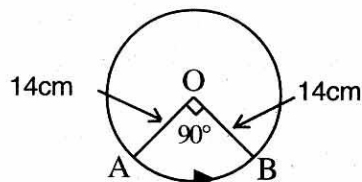


17. The radii of two circles are 4cm and 3cm respectively. Find the radius of a circle having

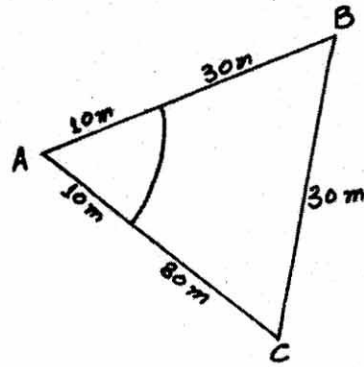
area equal to the sum of the areas of the circles. ($\Pi = \frac{22}{7}$)

18. Find the area of sector of a circle with radius 6cm and central angle of 120° .

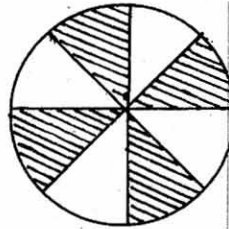
19. In the figure find I if O is the centre of the circle and radius is 14cm. ($\Pi = \frac{22}{7}$)



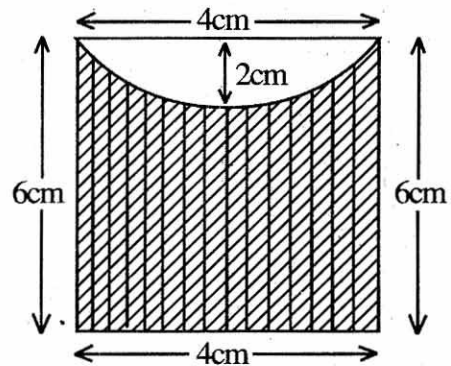
20. In fig. $\triangle ABC$ is an equilateral triangle of side 30m. A cow is tied at vertex A by mean of 10m long rope. What is area the cow can graze in?



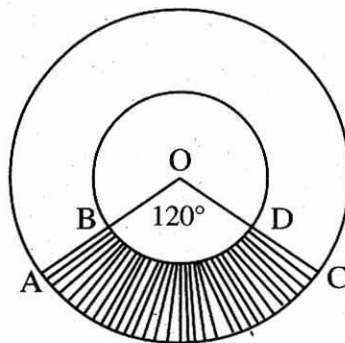
21. Find the area of the four blades of same size of radius 20cm and central angle 45° of a circular fan.



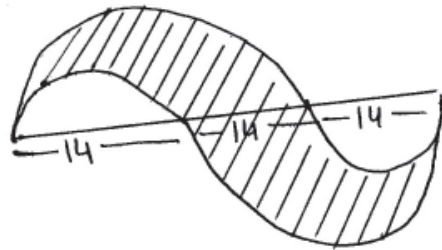
22. Find the perimeter of the shaded region.



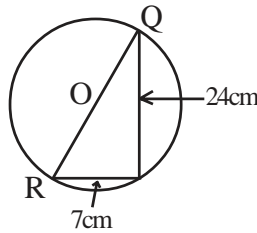
23. Two concentric circle with centre o and radius 7cm. & 14cm. If $\angle AOC = 120^\circ$.What is the area of shaded region?



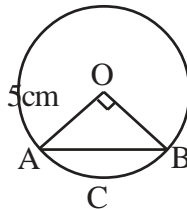
24. Find the perimeter of the shaded portion.



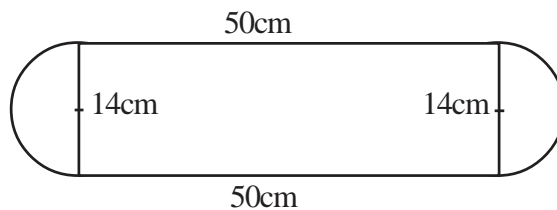
25. Find the circumference of the circle with centre O.



26. Chord AB subtends an angle of 90° at the centre o. Find the area of the minor segment ACBA if radius OB=5cm.

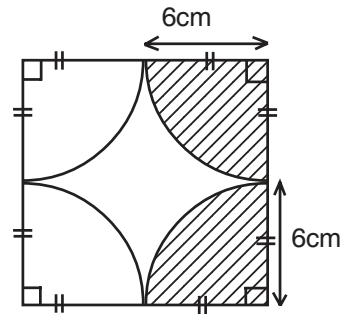


27. The radius of two circles are in the ratio 3 : 4 and sum of the areas of two circle is equal to the area of third circle. What is the radius of third circle?
28. What is the perimeter of the given plot?

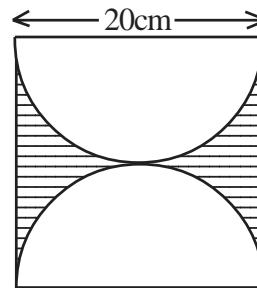


29. If an arc forms an angle of 90° at the centre of the circle then what is the ratio of its length to the circumference of the circle?
30. What is the area of the largest triangle that can be inscribed in a semicircle of radius r cm?
31. A piece of wire 20cm long is bent into an arc of a circle subtending an angle of 60° at the centre then what is the radius of the circle?

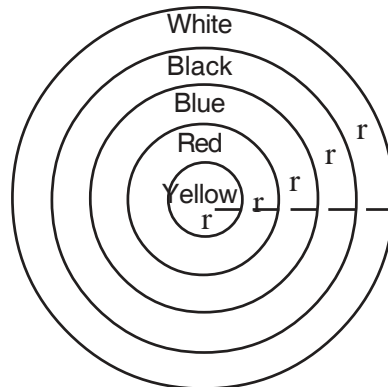
32. If an arc form an angle of 72° at the centre of the circle. Find the ratio of its length to its circumference.
33. The minute hand of a clock is $\sqrt{12}cm$ long. What is the area described by the minute hand between 8:00am to 8:05am?
34. What is the area of the shaded portion in the figure?



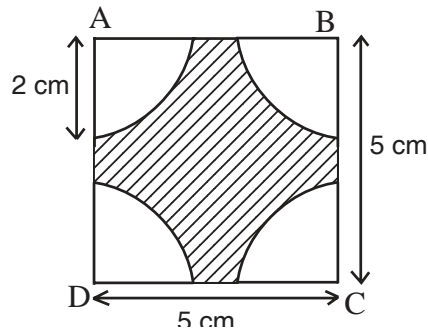
35. A paper is in the form of a square of side 20cm. Semicircle are down inside the square paper on two sides as diameter. The semicircular portions are cut off. Find the remaining paper. ($\pi = 3.14$)



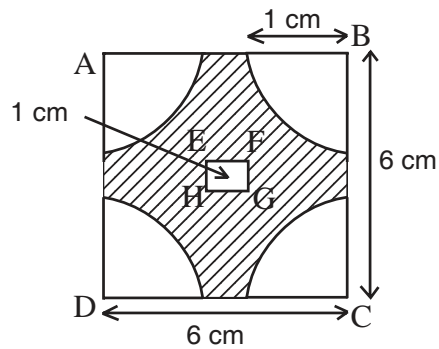
36. In the figure, What is the area of the blue rin



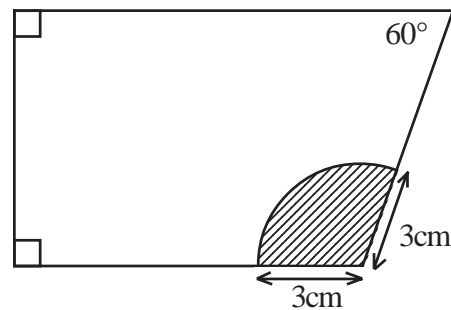
37. In the figure ABCD is the square of side 5cm. What is the area of the shaded region?



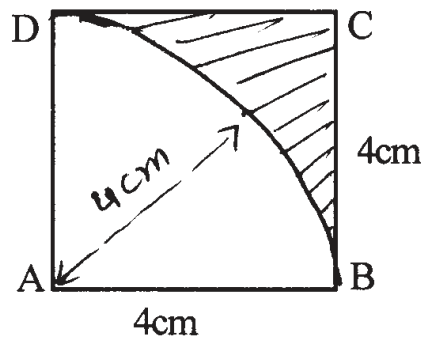
38. In the figure ABCD and EFGH are the square of sides 6cm and 1cm respectively. Find the area of the shaded region.



39. In the figure find the area of the sector.



40. ABCD is square kite of side 4cm. What is the area of the shaded portion?



Chapter - 11
Answer
AREAS RELATED TO CIRCLE

- | | | |
|----------------------|---------------------------------------|-----------------------|
| 1. $\frac{d^2}{4}$ | 19. 22cm | 36. $5r^2$ |
| 2. $\frac{r^2}{360}$ | 20. $\frac{50}{3} m^2$ | 37. $(25 - 4)cm^2$ |
| 3. 2 units | 21. $200\pi cm^2$ | 38. $(35 - \pi)cm^2$ |
| 4. R | 22. $(16 - 2) cm$ | 39. $3\pi cm^2$ |
| 5. 18cm. | 23. $154cm^2$ | 40. $(16 - 4\pi)cm^2$ |
| 6. 1 : 4 : 9 | 24. 42 | |
| 7. 19cm | 25. 25 cm | |
| 8. 7m | 26. $\frac{1}{4} \frac{1}{2} 25 cm^2$ | |
| 9. 36cm | 27. 5 | |
| 10. $77cm^2$ | 28. 144cm | |
| 11. 7cm | 29. 1 : 4 | |
| 12. 28cm | 30. r^2 | |
| 13. 66cm | 31. $\frac{60}{cm}$ | |
| 14. $133 cm^2$ | 32. 1 : 5 | |
| 15. $(h^2 - 2rh)$ | 33. cm^2 | |
| 16. $550m^2$ | 34. $18\pi cm^2$ | |
| 17. 5cm | 35. $86cm^2$ | |
| 18. 12 cm^2 | | |

Chapter - 12

SURFACE AREAS AND VOLUMES

1. What will be the volume of tank whose length is 10m, breadth 8m and height 6m?
2. How much aluminium sheet is required to make a box with lid of length 3m, breadth 2m and height 4m?
3. What will be the area of four walls of a room of length 12m, breadth 10m and height 9m?
4. An underground water tank is in the form of cube of side 6m. What will be its volume?
5. The volume of cube is $8a^3$, find its edge.
6. Volume of a cube is $1000cm^3$. What will be the length of its edge?
7. The length of a diagonal of a cube is 17.32cm. Find the volume of cube.
(use $\sqrt{3} = 1.732$)
8. Three cubes of the same metal, whose edges are 6, 8, 10cm are melted and formed into a single cube. Find the diagonal of the single cube.
9. Two cubes each of length 5m edge are joined end to end. What will be the surface area of the resulting cuboid?
10. Find the area of cardboard needed to make a rectangular box 14cm long, 9cm wide and 7cm high.
11. The total surface area of the cube is $216cm^2$.Find its edge.
12. What will be the volume of a cylindrical tank with radius 7cm and height 2cm.?
13. What is the number of solid spheres of radius $\frac{1}{2}cm$, which may be formed from a solid sphere of radius 2cm?
14. If the volume and surface area of a sphere are numerically same, then what is its radius?
15. If height of frustum is 4cm and the radii of two bases are 3cm and 6cm respectively, find the slant height of the frustum.
16. Volume of right circular cylinder is $448 cm^3$, height of cylinder is 7cm; Find the radius.

17. If surface area of sphere is 144 cm^2 . What is its radius?
18. If lateral surface area of a cube is 64cm^2 , what will be its edge?
19. Volume of hemisphere is 18 cm^3 , what will be its radius?
20. Curved surface area of a cone is 90 cm^2 . What will be the radius of the cone if its slant height is 90cm ?
21. Radius of sphere is 8cm . How many small spheres of radii 4cm can be formed out of it?
22. Volume of a cuboid is 240cm^3 . If its length is 4cm , breadth is 5cm , find the height of the cuboid.
23. Five equal cubes, each of side 6cm , are joined end to end. Find the surface area of the resulting cuboid.
24. The area of rhombus is 24cm^2 and one of its diagonal is 8cm . What is other diagonal of the rhombus?
25. What is the length of the largest rod that can be put in a box of inner dimensions 30cm , 24cm and 18cm ?
26. Curved surface area of cylinder is 16 cm^2 . Its radius is 4cm , then find its height.
27. 50 circular plates each of equal radius are placed one over the other to form a cylinder. Find the height of the cylinder so formed, thickness of each plate is $1/2\text{cm}$.
28. There are two cones. The lateral surface area of one cone is twice the lateral surface area of second cone. The slant height of second cone is twice the slant height of first cone, find the ratio of their radii.
29. If volume of a solid sphere is $288\pi\text{cm}^3$, find its radius.
30. A cone of height 4cm and radius 8cm is reshaped by a child to form a sphere. Find the radius of the sphere.
31. A well of diameter 2m is dug 14m deep. Find the volume of the earth dug out.
32. A largest sphere is carved out of a cube of side 7cm ; find the radius.
33. If the volumes of two cones are in the ratio $1 : 4$ and their diameters are in the ratio $4 : 5$, what would be the ratio of their heights?
34. A right cylindrical vessel is full of water. How many right cones having the same diameter and height as those of the right cylinder will be needed to store that water?

35. A wooden box of dimensions $8m \times 7m \times 6m$ is to carry rectangular boxes of dimension $8cm \times 7cm \times 6cm$, find the maximum number of boxes that can be carried out in the wooden box.
36. Find the slant height of a cone, if height 12cm and radius is 5cm.
37. If the semi-vertical angle of a cone of height 3cm is 60° , find its volume.
38. Find the edge of cube if volume of the cube is equal to the volume of cuboid of dimensions $8 \times 4 \times 2$.
39. The volume of a 8cm x 4cm x 2cm cylindrical rod is 980 cm^3 . If its height is 20cm, find the radius of its cross section.
40. Find the volume of cone of height 2h and radius r.
41. A right circular cylinder is closed at both ends, whose flat area is equal to its total curve surface. What is the relationship between r and h?
42. Find the radius of the largest right circular cone that can be cut out of a cube whose edge is 9cm.
43. The volume of a room is $5760m^3$. Its length and width are 24m and 20m, find the height.
44. The Circumference of the circular edge of solid hemispherical ball is 132cm. Find the radius of ball.
45. 500 persons took dip in a rectangular tank which is 80m long and 50m broad. What is the rise in level of water in the tank if the average displacement of water by a person is $0.04m^3$?
46. If the radius and height of a cylinder are in the ratio 2 : 7 and its volume is $88m^3$, then what will be its radius?
47. If a sphere of diameter 12cm is melted and drawn into a wire of diameter 0.2cm, find the length of the wire.
48. What is the total surface area of a solid hemisphere of radius R?
49. Cube of sides 2cm is cut down into cubes of sides 1cm. What is the ratio of surface area of smaller cubes to that of larger cube?
50. In a shower, there is 5cm rain falls. Find in cubic metre the volume of water that falls on 2 hectares of ground. (1 hectare = $10,000m^2$)

Chapter - 12
Answer
SURFACE AREAS AND VOLUMES

- | | | | | | |
|-----|----------------|-----|----------------|-----|--------------------|
| 1. | $480m^3$ | 19. | 3cm | 38. | 4cm |
| 2. | $52m^2$ | 20. | 1cm | 39. | 7cm |
| 3. | $396m^2$ | 21. | 8 | 40. | $\frac{2}{3} r^2h$ |
| 4. | $216m^3$ | 22. | 12cm | 41. | $r = h$ |
| 5. | 2a | 23. | $792m^2$ | 42. | 4.5cm |
| 6. | 10cm | 24. | 6cm | 43. | 12m |
| 7. | $1000cm^3$ | 25. | $30\sqrt{2}cm$ | 44. | 21cm |
| 8. | $12\sqrt{3}cm$ | 26. | 2cm | 45. | 0.5cm or .005m |
| 9. | $250m^2$ | 27. | 25cm | 46. | 2m |
| 10. | $574m^2$ | 28. | 4 : 1 | 47. | 288m |
| 11. | 6cm | 29. | 6cm | 48. | $3\pi R^2$ |
| 12. | $308cm^3$ | 30. | 4cm | 49. | 1 : 4 |
| 13. | 64 | 31. | $44m^3$ | 50. | $1000m^3$ |
| 14. | 3 | 32. | 3.5cm | | |
| 15. | 5cm | 33. | 25 : 64 | | |
| 16. | 8cm | 34. | 3 | | |
| 17. | 6cm | 35. | 10,00,000 | | |
| 18. | 4cm | 36. | 13cm | | |
| | | 37. | 27 cm^3 | | |

Chapter - 13

STATISTICS AND PROBABILITY

1. What is the mean of n numbers x_1, x_2, \dots, x_n ?
2. What is the mean of observations x_1, x_2, \dots, x_n with frequencies f_1, f_2, \dots, f_n ?
3. What is the mean of the data 6, 8, 7, 3, 2?
4. The number of children of 10 families of a locality are 2, 4, 3, 4, 2, 0, 3, 5, 1, 1. What is the mean number of children per family?
5. What is the mean of data $x, x + 2, x + 4, x + 6, x + 8$?
6. Find the mean of first five natural numbers.
7. For the numbers 9.6, 5.2, 3.5, 1.5, 1.6, 2.4, 2.6, 8.4, 10.3, 10.9 find $\sum_{i=1}^{10} (x_i - \bar{x})$.
8. Find the frequencies:-

Below 10	5
Below 20	9
Below 30	17
Below 40	29
Below 50	45
9. Find the missing frequency p if $\sum f_i = 30$ and

Class Marks :	12	14	16	18	20
Frequencies :	3	6	9	p	4
10. The mean of 20 numbers is 17. If 3 is added to every number, then find the new mean.
11. If \bar{x} is the mean of n observations x_1, x_2, \dots, x_n then find $\sum_{i=1}^n (x_i - \bar{x})$.

12. Find the mean of first five prime numbers.
13. The mean of 6, 4, 7, x and 14 is 8. Find x.
14. Find the frequencies of the data:-

Above 0	80
Above 10	77
Above 20	72
Above 30	65
Above 40	55

15. The mean of 5 numbers is 18. If one number is excluded their mean is 16. Find the excluded number.
16. In the following data what is $\sum fi$?

x	10	15	20	25
f	5	10	p	8

17. Find the mean of first five odd natural numbers.
18. The scores of two batsmen A and B in five innings of a test series are

A	:	55	60	60	65	45
B	:	120	80	30	20	10

What is the mean score of batsman B?

19. Find the sum of deviations of the variate values 3, 4, 6, 8, 14 from their mean.
20. The mean of 20 numbers is 35. If each number is divided by 5 then what is the new mean.
21. What is the mean of first five composite numbers?
22. In the following data what is $\sum fixi$?

x	:	5	10	15	20
f	:	7	p	8	4
xf	:	35	10p	120	80

23. The mean of 40 observations was 160. It was detected on rechecking that the value of 165 was wrongly copied as 125 for computing of mean. Find the correct mean.
24. If $u_i = \frac{x_i - 25}{10}$, $\sum f_i u_i = 20$ and $\sum f_i = 100$ then find the value of \bar{x} .
25. In a factory the daily wages of 5 workers are 20, 40, 42, 45 and 33. If the daily wages of each worker is increased by Rs. 5, find the mean wage.
26. What is the median of numbers:-
16, 17, 18, 20, 21, 24, 25, 26, 28?
27. Find the median of the numbers :-
7, 8, 9, 11, 13, 14, 15, 16
28. What is the value of x if the median of given data is 27.5?
24, 25, 26, x + 2, x + 3, 30, 31, 34
29. What is the mode of the given data?
2, 2, 3, 5, 5, 7, 7, 2, 3, 4, 7, 2
30. Find the value of x if the mode of the data is 18.
16, 18, 17, 16, 18, x, 19, 17, 14
31. If mode of the data (given) is 43 then what is the value of x + 2?
34, 43, 48, 43, x, 48, 60, 64
32. If 27 is taken out from the given data then what is the new median?
20, 24, 25, 26, 27, 28, 29, 30
33. When 93 is added to the data given below what is the new median?
43, 47, 51, 53, 67, 79, 84, 97
34. If the probability of winning a game is 0.7, what is the probability of losing it?
35. A pair of dice is thrown once. Find the probability of getting a sum of 11.
36. A bag contains 7 red, 5 white and 9 black balls. One ball is drawn from the bag. Find the probability that it is not a red ball.
37. A bag contains 20 cards numbering 1, 2, 3, , 20. One card is drawn

from the bag. Find the probability that it has a prime number.

38. How many face cards are there in a well shuffled pack of cards?
39. In 1000 lottery tickets there are 5 prize winning tickets. Find the probability of winning a prize if a person buys one ticket.
40. It is known that in a box of 600 screws, 42 screws are defective. One screw is taken out at random from this box. Find the probability that it is a good screw.
41. Five male and three female candidates are available for selection of one manager in a company. Find the probability that female is selected.
42. What are all the possible outcomes when a coin is tossed twice?
43. A child has a block in the shape of a cube with one letter written on each face as shown below:-

A	B	C	B	D	D
---	---	---	---	---	---

The cube is thrown once. Find the probability of getting B or C.

44. If E be an event such that $P(E) = \frac{3}{7}$, what is P (not E) equal to?
45. A bag contains 5 red balls and n green balls. If the probability of drawing a green ball is three times that of a red ball then what is the value of n?
46. If from the well shuffled pack of cards all the aces are removed, find the probability of getting red card.
47. From the data (1, 4, 9, 16, 25, 29) if 29 is removed. What is the probability of getting a prime number?
48. What is the probability of getting a total of less than 12 in the throws of two dice?
49. Cards marked with numbers 1,2,3, ,100 are placed in a bag and mixed thoroughly. One card is drawn. What is the probability that card drawn has an even number?
50. A card is drawn from an ordinary pack of playing cards and a person bets that it is a spade or an ace. What are the odds against his winning the bet?

Chapter - 13
Answer
STATISTICS AND PROBABILITY

- | | | | | | |
|-----|---------------------------------|-----|----------------|-----|------------------|
| 1. | $\frac{\sum x_i}{n}$ | 20. | 7 | 39. | $\frac{1}{200}$ |
| 2. | $\frac{\sum x_i f_i}{\sum f_i}$ | 21. | 7.4 | 40. | $\frac{93}{100}$ |
| 3. | 5.2 | 22. | 235 + 10p | 41. | $\frac{3}{8}$ |
| 4. | 2.5 | 23. | 161 | 42. | HH, HT, TH, TT |
| 5. | x + 4 | 24. | 27 | 43. | $\frac{1}{2}$ |
| 6. | 3 | 25. | 41 | 44. | $\frac{4}{7}$ |
| 7. | 0 | 26. | 21 | 45. | 15 |
| 8. | 5, 4, 8, 12, 16 | 27. | 12 | 46. | $\frac{1}{2}$ |
| 9. | 8 | 28. | x = 25 | 47. | Zero |
| 10. | 20 | 29. | 2 | 48. | $\frac{35}{36}$ |
| 11. | 0 | 30. | 18 | 49. | $\frac{1}{2}$ |
| 12. | 5.6 | 31. | 45 | 50. | $\frac{9}{13}$ |
| 13. | 9 | 32. | 26 | | |
| 14. | 3, 5, 7, 10 | 33. | 67 | | |
| 15. | 26 | 34. | 0.3 | | |
| 16. | 23 + p | 35. | $\frac{1}{18}$ | | |
| 17. | 5 | 36. | $\frac{2}{3}$ | | |
| 18. | 52 | 37. | $\frac{2}{5}$ | | |
| 19. | 0 | 38. | 12 | | |