Sainik School Amethi

SUMMER HOLIDAY HOMEWORK

(2024-25)

CLASS: 10TH

SUBJECT: MATHEMATICS

Instructions –

1. All the questions are compulsory. Writing the question before the answer of the question and INDEX page is also necessary.

2. Solve the given worksheet and activities in a separate notebook.

3. Detailed solution of all the questions is required. Given activities is to be done as per instruction given in the question.

Topic – Trigonometry

1. In Δ ABC, right-angled at B, AB = 24 cm, BC = 7 cm. The value of tan C is:

(a) 12/7 (b) 24/7
(c) 20/7 (d) 7/24

2. (Sin 30°+cos 60°) - (sin 60° + cos 30°) is equal to:

(a) 0 (b) 1+2√3
(c) 1-√3 (d) 1+√3

3. The value of tan 60°/cot 30° is equal to:

(a) 0 (b) 1
(c) 2 (d) 3

4. $1 - \cos^2 A$ is equal to:

(a) $\sin^2 A$ (b) $\tan^2 A$
(c) $1 - \sin^2 A$ (d) $\sec^2 A$

5. If cos X = ⅔ then tan X is equal to:

(a) $5/2$ (b) $\sqrt{(5/2)}$
(c) $\sqrt{5}/2$ (d) $2/\sqrt{5}$

6. If $\cos X = a/b$, then $\sin X$ is equal to:

(a) $(b^2-a^2)/b$ (b) $(b-a)/b$
(c) $\sqrt{(b^2-a^2)}/b$ (d) $\sqrt{(b-a)}/b$

7. The value of $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ is:

(a) 0 (b) 1
(c) 2 (d) 4

8. $2 \tan 30^\circ / (1 + \tan^2 30^\circ) =$

(a) $\sin 60^\circ$ (b) $\cos 60^\circ$
(c) $\tan 60^\circ$ (d) $\sin 30^\circ$

9. $\sin 2A = 2 \sin A$ is true when A =

(a) 30° (b) 45°
(c) 0° (d) 60°

10. The value of $(\sin 45^\circ + \cos 45^\circ)$ is:

(a) $1/\sqrt{2}$ (b) $\sqrt{2}$
(c) $\sqrt{3}/2$ (d) 1

11. If $\sin A = 1/2$, then the value of $\cot A$ is:

(a) $\sqrt{3}$ (b) $1/\sqrt{3}$
(c) $\sqrt{3}/2$ (d) 1

12. If ΔABC is right angled at C, then the value of $\cos(A+B)$ is:

(a) 0 (b) 1
(c) ½ (d) $\sqrt{3}/2$

13. If $\cos(\alpha + \beta) = 0$, then $\sin(\alpha - \beta)$ can be reduced to:

(a) $\cos \beta$ (b) $\cos 2\beta$
(c) $\sin \alpha$ (d) $\sin 2\alpha$

14. If $\sin A + \sin^2 A = 1$, then the value of the expression $(\cos^2 A + \cos^4 A)$ is:

(a) 1 (b) 1/2
(c) 2 (d) 3

15. If $\cos 9\alpha = \sin\alpha$ and $9\alpha < 90°$, then the value of $\tan 5\alpha$ is

(a) $1/\sqrt{3}$ (b) $\sqrt{3}$
(c) 1 (d) 0

16. The value of the expression $\sin^6\theta + \cos^6\theta + 3 \sin^2\theta \cos^2\theta$ is:

(a) 0 (b) 3
(c) 2 (d) 1

17. In triangle ABC, right-angled at B, if $\tan A = 1/\sqrt{3}$ find the value of:
$\sin A \cos C + \cos A \sin C$

18. Prove that, If $\cos A + \cos^2 A = 1$, then $\sin^2 A + \sin^4 A = 1$.

19. Prove that, $(\sin \alpha + \cos \alpha)(\tan \alpha + \cot \alpha) = \sec \alpha + \text{cosec } \alpha$

20. If $\text{cosec } \theta + \cot \theta = p$, then prove that $\cos \theta = (p^2 - 1)/(p^2 + 1)$.

21. If $1 + \sin^2\theta = 3\sin\theta \cos \theta$, then prove that $\tan \theta = 1$ or ½.

22. Given that $\sin \theta + 2\cos\theta = 1$, then prove that $2\sin\theta - \cos \theta = 2$.

23. Prove that $(\sqrt{3}+1)(3 - \cot 30°) = \tan^3 60° - 2 \sin 60°$

24. Prove that $(\tan \theta + 2)(2 \tan \theta + 1) = 5 \tan \theta + 2 \sec^2 \theta$.

25. Assertion: In a right ΔABC, right angled at B, if $\tan A=1$, then $2\sin A.\cos A=1$

Reason: cosec A is the abbreviation used for cosecant of angle A.

26. Assertion (A): If in a circle, the radius of the circle is 3 cm and distance of a point from the center of a circle is 5 cm, then length of the tangent will be 4 cm.

Reason (R): $(\text{hypotenuse})^2 = (\text{base})^2 + (\text{height})^2$

27. Assertion: sin A is the product of sin & A.

Reason: The value of sin θ increases as θ increases.

Topic – Polynomials

1. The zeroes of x^2-2x-8 are:

(a) (2, -4) (b) (4, -2)
(c) (-2, -2) (d) (-4, -4)

2. What is the quadratic polynomial whose sum and the product of zeroes is $\sqrt{2}$, $\frac{1}{3}$ respectively?

(a) $3x^2-3\sqrt{2}x+1$ (b) $3x^2+3\sqrt{2}x+1$
(c) $3x^2+3\sqrt{2}x-1$ (d) None of the above

3. If the zeroes of the quadratic polynomial ax^2+bx+c, $c\neq0$ are equal, then:

(a) c and b have opposite signs (b) c and a have opposite signs
(c) c and b have same signs (d) c and a have same signs

4. The degree of the polynomial, $x^4 - x^2 + 2$ is:

(a) 2 (b) 4
(c) 1 (d) 0

5. If one of the zeroes of cubic polynomial is x^3+ax^2+bx+c is -1, then product of other two zeroes is:

(a) b-a-1 (b) b-a+1
(c) a-b+1 (d) a-b-1

6. If p(x) is a polynomial of degree one and p(a) = 0, then a is said to be:

(a) Zero of $p(x)$ (b) Value of $p(x)$
(c) Constant of $p(x)$ (d) None of the above

7. Zeroes of a polynomial can be expressed graphically. Number of zeroes of polynomial is equal to number of points where the graph of polynomial is:

(a) Intersects x-axis (b) Intersects y-axis
(c) Intersects y-axis or x-axis (d) None of the above

8. A polynomial of degree n has:

(a) Only one zero (b) At least n zeroes
(c) More than n zeroes (d) At most n zeroes

9. The number of polynomials having zeroes as -2 and 5 is:

(a) 1 (b) 2
(c) 3 (d) More than 3

10. Zeroes of $p(x) = x^2-27$ are:

(a) $\pm 9\sqrt{3}$ (b) $\pm 3\sqrt{3}$
(c) $\pm 7\sqrt{3}$ (d) None of the above

11. Given that two of the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$ are 0, the third zero is:

(a) $-b/a$ (b) b/a
(c) c/a (d) $-d/a$

12. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is:

(a) 10 (b) –10
(c) 5 (d) –5

13. A quadratic polynomial, whose zeroes are –3 and 4, is:

(a) $x^2 - x + 12$ (b) $x^2 + x + 12$
(c) $(x^2/2) - (x/2) - 6$ (d) $2x^2 + 2x - 24$

14. The zeroes of the quadratic polynomial $x^2 + 99x + 127$ are:

(a) both positive (b) both negative
(c) one positive and one negative (d) both equal

15. The zeroes of the quadratic polynomial $x^2 + 7x + 10$ are:

(a) -4, -3 (b) 2, 5
(c) -2, -5 (d) -2, 5

16. If the discriminant of a quadratic polynomial, $D > 0$, then the polynomial has:

(a) two real and equal roots (b) two real and unequal roots
(c) imaginary roots (d) no roots

17. If on division of a polynomial $p(x)$ by a polynomial $g(x)$, the quotient is zero, then the relation between the degrees of $p(x)$ and $g(x)$ is:

(a) degree of $p(x)$ < degree of $g(x)$
(b) degree of $p(x)$ = degree of $g(x)$
(c) degree of $p(x)$ > degree of $g(x)$
(d) nothing can be said about degrees of $p(x)$ and $g(x)$

18. By division algorithm of polynomials, $p(x)$ =

(a) $g(x) \times q(x) + r(x)$ (b) $g(x) \times q(x) - r(x)$
(c) $g(x) \times q(x) \times r(x)$ (d) $g(x) + q(x) + r(x)$

19. The product of the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$ is:

(a) -b/a (b) c/a (c) -d/a (d) -c/a

20. If the graph of a polynomial intersects the x-axis at three points, then it contains ____ zeroes.

(a) Three (b) Two (c) Four (d) More than three

21. Find the zeroes of $4s^2-4s+1$ and verify the relationship between the zeroes and the coefficients.

22. Find the values of k for $2x^2 + kx + 3 = 0$ so that they have two equal roots.

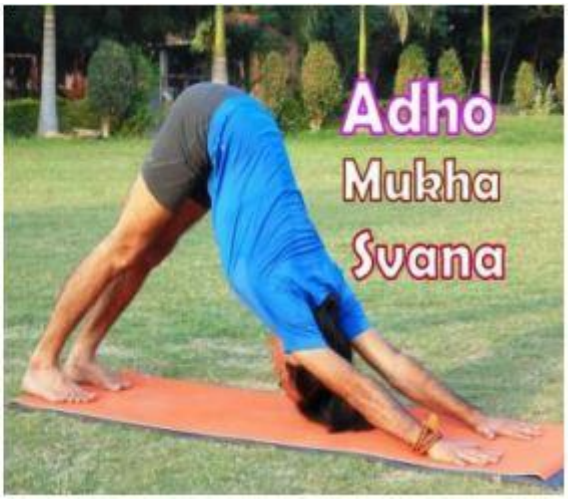
23. Can the quadratic polynomial $x^2 + kx + k$ have equal zeroes for some odd integer $k > 1$?

24. Find the zeroes of the following polynomials by factorization method.
$t^3 - 2t^2 - 15t$

25. Given that the zeroes of the cubic polynomial $x^3 - 6x^2 + 3x + 10$ are of the form $a, a + b, a + 2b$ for some real numbers a and b, find the values of a and b as well as the zeroes of the given polynomial.

26. Given that $\sqrt{2}$ is a zero of the cubic polynomial $6x^3 + \sqrt{2}x^2 - 10x - 4\sqrt{2}$, find its other two zeroes.

27. An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.



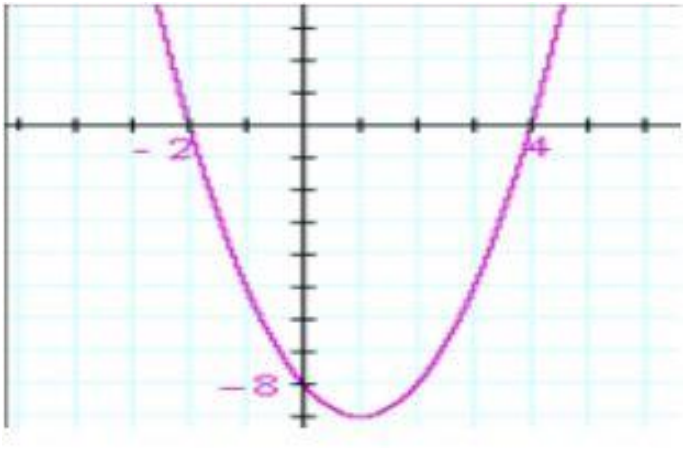
i. The shape of the poses shown is

a) Spiral b) Ellipse c) Linear d) Parabola

ii. The graph of parabola opens downwards, if _____

a) $a \geq 0$ b) $a = 0$ c) $a < 0$ d) $a > 0$

iii. In the graph, how many zeroes are there for the polynomial?



a) 0 b) 1 c) 2 d) 3

iv. The two zeroes in the above shown graph are

a) 2, 4 b) -2, 4 c) -8, 4 d) 2, -8

5. The zeroes of the quadratic polynomial $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ are

a) $\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$

b) $-\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$

c) $\frac{2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$

d) $-\frac{2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$

Topic – Linear equation in two variables

1. The pairs of equations x+2y-5 = 0 and -4x-8y+20=0 have:

(a) Unique solution (b) Exactly two solutions
(c) Infinitely many solutions (d) No solution

2. If a pair of linear equations is consistent, then the lines are:

(a) Parallel (b) Always coincident
(c) Always intersecting (d) Intersecting or coincident

3. The pairs of equations 9x + 3y + 12 = 0 and 18x + 6y + 26 = 0 have:

(a) Unique solution (b) Exactly two solutions
(c) Infinitely many solutions (d) No solution

4. If the lines 3x+2ky − 2 = 0 and 2x+5y+1 = 0 are parallel, then what is the value of k?

(a) 4/15 (b) 15/4 (c) $\frac{4}{5}$ (d) 5/4

5. If one equation of a pair of dependent linear equations is -3x+5y-2=0. The second equation will be:

(a) -6x+10y-4=0 (b) 6x-10y-4=0
(c) 6x+10y-4=0 (d) -6x+10y+4=0

6. The solution of the equations x-y=2 and x +y=4 is:

(a) 3 and 1 (b) 4 and 3 (c) 5 and 1 (d) -1 and -3

7. A fraction becomes 1/3 when 1 is subtracted from the numerator and it becomes 1/4 when 8 is added to its denominator. The fraction obtained is:

(a) 3/12 (b) 4/12 (c) 5/12 (d) 7/12

8. The solution of 4/x+3y=14 and 3/x-4y=23 is:

(a) $\frac{1}{5}$ and -2 (b) $\frac{1}{3}$ and $\frac{1}{2}$ (c) 3 and $\frac{1}{2}$ (d) 2 and $\frac{1}{3}$

9. Ritu can row downstream 20 km in 2 hours, and upstream 4 km in 2 hours. Her speed of rowing in still water and the speed of the current is:

(a) 6km/hr and 3km/hr (b) 7km/hr and 4km/hr
(c) 6km/hr and 4km/hr (d) 10km/hr and 6km/hr

10. The angles of cyclic quadrilaterals ABCD are: A = (6x+10), B=(5x)°, C = (x +y)° and D=(3y-10)°. The value of x and y is:

(a) x=20° and y = 10° (b) x=20° and y = 30°
(c) x=44° and y=15° (d) x=15° and y=15°

11. The pair of equations x = a and y = b graphically represents lines which are:

(a) parallel (b) intersecting at (b, a)
(c) coincident (d) intersecting at (a, b)

12. The pair of equations 5x – 15y = 8 and 3x – 9y = 24/5 has:

(a) one solution (b) two solutions
(c) infinitely many solutions (d) no solution

13. The pair of equations x + 2y + 5 = 0 and –3x – 6y + 1 = 0 have:

(a) a unique solution (b) exactly two solutions
(c) infinitely many solutions (d) no solution

14. The value of c for which the pair of equations cx – y = 2 and 6x – 2y = 3 will have infinitely many solutions is:

(a) 3 (b) -3 (c) -12 (d) no value

15. If the lines representing the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are coincident, then:

(a) $a_1/a_2 = b_1/b_2$ (b) $a_1/a_2 = b_1/b_2 = c_1/c_2$
(c) $a_1/a_2 \neq b_1/b_2$ (d) $a_1/a_2 = b_1/b_2 \neq c_1/c_2$

16. A pair of linear equations which has a unique solution x = 2, y = -3 is

(a) x + y = -1; 2x – 3y = -5 (b) 2x + 5y = -11; 4x + 10y = -22
(c) 2x – y = 1; 3x + 2y = 0 (d) x – 4y – 14 = 0; 5x – y – 13 = 0

17. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages, in years, of the son and the father are, respectively:

(a) 4 and 24 (b) 5 and 30
(c) 6 and 36 (d) 3 and 24

18. If the pair of linear equations has a unique solution, then the lines representing these equations will:

(a) coincide (b) intersect at one point
(c) parallel to each other (d) parallel to x-axis

19. Which of the following method(s) is/are used to find the solution of a pair of linear equations algebraically?

(a) Substitution Method (b) Elimination Method
(c) Cross- multiplication Method (d) All the above

20. The graphical representation of a pair of equations $4x + 3y - 1 = 5$ and $12x + 9y = 15$ will be:

(a) parallel lines (b) coincident lines
(c) intersecting lines (d) perpendicular lines

21. Solve the following pair of linear equation by the substitution method:

$0.2x + 0.3y = 1.3$
$0.4x + 0.5y = 2.3$

22. For which values of a and b will the following pair of linear equations have infinitely many solutions?

$x + 2y = 1$
$(a - b)\,x + (a + b)\,y = a + b - 2$

23. Graphically, solve the following pair of equations:
$2x + y = 6$
$2x - y + 2 = 0$

Find the ratio of the areas of the two triangles formed by the lines representing these equations with the *x*-axis and the lines with the *y*-axis.

24. Draw the graphs of the equations $x = 3$, $x = 5$ and $2x - y - 4 = 0$. Also, find the area of the quadrilateral formed by the lines and the *x*–axis.

25. Ankita travels 14 km to her home partly by rickshaw and partly by bus. She takes half an hour if she travels 2 km by rickshaw and the remaining distance by bus. On the other hand, if she travels 4 km by rickshaw and the remaining distance by bus, she takes 9 minutes longer. Find the speed of the rickshaw and of the bus.

26. Assertion (A): For all real values of c, the pair of equation x-2y=8 and 5x-10y=c have a unique solution.

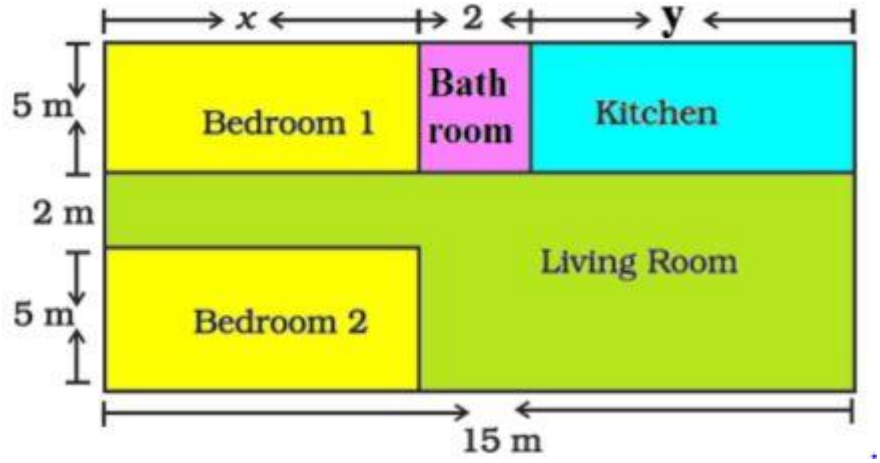
    Reason (R): Two lines are given to be parallel. The equation of one of the lines is 4x+3y=14, 12x+9y=5

27. A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while ¼ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

Type of Question	**Marks given for correct answer**	**Marks deducted for wrong answer**
True/False	1	0.25

i. If answer to all questions he attempted by guessing were wrong, then how many questions did he answer correctly?
ii. How many questions did he guess?
iii. If answer to all questions he attempted by guessing were wrong and answered 80 correctly, then how many marks he got?
iv. If answer to all questions he attempted by guessing were wrong, then how many questions answered correctly to score 95 marks?

28. Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.



Based on the above information, answer the following questions:

i. Form the pair of linear equations in two variables from this situation.
ii. Find the length of the outer boundary of the layout.
iii. Find the area of each bedroom and kitchen in the layout.
iv. Find the area of living room in the layout.
v. Find the cost of laying tiles in kitchen at the rate of Rs. 50 per sq.m.

Topic – Quadratic Equation

1. Equation of $(x+1)^2-x^2=0$ has number of real roots equal to:

   (a) 1 (b) 2 (c) 3 (d) 4

2. The roots of $100x^2 - 20x + 1 = 0$ is:
   (a) 1/20 and 1/20 (b) 1/10 and 1/20
   (c) 1/10 and 1/10 (d) None of the above

3. The sum of two numbers is 27 and product is 182. The numbers are:

   (a) 12 and 13 (b) 13 and 14 (c) 12 and 15 (d) 13 and 24

4. If ½ is a root of the quadratic equation $x^2-mx-5/4=0$, then value of m is:

(a) 2 (b) -2 (c) -3 (d) 3

5. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, the other two sides of the triangle are equal to:

(a) Base=10cm and Altitude=5cm
(b) Base=12cm and Altitude=5cm
(c) Base=14cm and Altitude=10cm
(d) Base=12cm and Altitude=10cm

6. The roots of quadratic equation $2x^2 + x + 4 = 0$ are:

(a) Positive and negative (b) Both Positive
(c) Both Negative (d) No real roots

7. The sum of the reciprocals of Rehman's ages 3 years ago and 5 years from now is 1/3. The present age of Rehman is:

(a) 7 (b) 10 (c) 5 (d) 6

8. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

(a) 30 km/hr (b) 40 km/hr
(c) 50 km/hr (d) 60 km/hr

9. If one root of equation $4x^2-2x+k-4=0$ is reciprocal of the other. The value of k is:

(a) -8 (b) 8 (c) -4 (d) 4

10. Which one of the following is not a quadratic equation?

(a) $(x + 2)^2 = 2(x + 3)$ (b) $x^2 + 3x = (-1)(1 - 3x)^2$
(c) $(x + 2)(x - 1) = x^2 - 2x - 3$ (d) $x^3 - x^2 + 2x + 1 = (x + 1)^3$

12. Which of the following equations has 2 as a root?

(a) $x^2 - 4x + 5 = 0$ (b) $x^2 + 3x - 12 = 0$
(c) $2x^2 - 7x + 6 = 0$ (d) $3x^2 - 6x - 2 = 0$

13. A quadratic equation $ax^2 + b x + c = 0$ has no real roots, if:

(a) $b^2 - 4ac > 0$ (b) $b^2 - 4ac = 0$
(c) $b^2 - 4ac < 0$ (d) $b^2 - ac < 0$

14. The product of two consecutive positive integers is 360. To find the integers, this can be represented in the form of quadratic equation as:

(a) $x^2 + x + 360 = 0$ (b) $x^2 + x - 360 = 0$
(c) $2x^2 + x - 360$ (d) $x^2 - 2x - 360 = 0$

15. The equation which has the sum of its roots as 3 is:

(a) $2x^2 - 3x + 6 = 0$ (b) $-x^2 + 3x - 3 = 0$
(c) $\surd 2x^2 - 3/\surd 2x + 1 = 0$ (d) $3x^2 - 3x + 3 = 0$

16. The quadratic equation $2x^2 - \surd 5x + 1 = 0$ has:

(a) two distinct real roots (b) two equal real roots
(c) no real roots (d) more than 2 real roots

17. The equation $(x + 1)^2 - 2(x + 1) = 0$ has

(a) two real roots (b) no real roots
(c) one real root (d) two equal roots

18. The quadratic formula to find the roots of a quadratic equation $ax^2 + b x + c = 0$ is given by:

(a) $[-b \pm \surd(b^2-ac)]/2a$ (b) $[-b \pm \surd(b^2-2ac)]/a$
(c) $[-b \pm \surd(b^2-4ac)]/4a$ (d) $[-b \pm \surd(b^2-4ac)]/2a$

19. The quadratic equation $x^2 + 7x - 60$ has:

(a) two equal roots (b) two real and unequal roots
(c) no real roots (d) two equal complex roots

20. The maximum number of roots for a quadratic equation is equal to:

(a) 1 (b) 2 (c) 3 (d) 4

21. Check whether the following are quadratic equations or not:

(i) $x^2 + 3x + 1 = (x - 2)^2$

(ii) $(x + 2)^3 = 2x (x^2 - 1)$

22. Find the nature of the roots of $2x^2 - 3x + 5 = 0$. If the real roots exist, find them.

23. Find the roots of the quadratic equations by using the quadratic formula in each of the following:

i. $2x^2 - 3x - 5 = 0$

ii. $5x^2 + 13x + 8 = 0$

iii. $-3x^2 + 5x + 12 = 0$

iv. $-x^2 + 7x - 10 = 0$

v. $x^2 + 2\sqrt{2}x - 6 = 0$

vi. $x^2 - 3\sqrt{5}x + 10 = 0$

vii. $(\frac{1}{2})x^2 - \sqrt{11}x + 1 = 0$

24. Find a natural number whose square diminished by 84 is equal to thrice of 8 more than the given number.

25. A natural number, when increased by 12, equals 160 times its reciprocal. Find the number.

26. If Zeba were younger by 5 years than what she really is, then the square of her age (in years) would have been 11 more than five times her actual age. What is her age now?

27. Assertion: $x^2 + 4x + 5$ has two real zeroes.

Reason: A quadratic polynomial can have at the most two zeroes.

28. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete the journey of 400 km.

i. What will be the distance covered by Ajay's car in two hours?

a) 2(x + 5) km b) (x – 5) km c) 2(x + 10) km d) (2x + 5) km

ii. Which of the following quadratic equation describe the speed of Raj's car?

a) $x^2 - 5x - 500 = 0$ b) $x^2 + 4x - 400 = 0$

c) $x^2 + 5x - 500 = 0$ d) $x^2 - 4x + 400 = 0$

iii. What is the speed of Raj's car?

a) 20 km/hour b) 15 km/hour c) 25 km/hour d) 10 km/hour

iv. How much time took Ajay to travel 400 km?

a) 20 hours b) 40 hours c) 25 hours d) 16 hours

Topic – Arithmetic Progression

1. In an Arithmetic Progression, if a = 28, d = -4, n = 7, then a_n is:

(a) 4 (b) 5 (c) 3 (d) 7

2. If a = 10 and d = 10, then first four terms will be:

(a) 10, 30, 50, 60 (b) 10, 20, 30, 40
(c) 10, 15, 20, 25 (d) 10, 18, 20, 30

3. The first term and common difference for the A.P. 3, 1, -1, -3 is:

(a) 1 and 3 (b) -1 and 3 (c) 3 and -2 (d) 2 and 3

4. 30th term of the A.P: 10, 7, 4, ..., is

(a) 97 (b) 77 (c) -77 (d) -87

5. 11th term of the A.P. -3, -1/2, 2 .... Is:

(a) 28 (b) 22 (c) -38 (d) -48

6. The missing terms in AP: __, 13, __, 3 are:

(a) 11 and 9 (b) 17 and 9
(c) 18 and 8 (d) 18 and 9

7. Which term of the A.P. 3, 8, 13, 18, ... is 78?

(a) 12^{th} (b) 13^{th} (c) 15^{th} (d) 16^{th}

8. The 21st term of AP whose first two terms are -3 and 4 is:

(a) 17 (b) 137 (c) 143 (d) -143

9. If 17th term of an A.P. exceeds its 10th term by 7. The common difference is:

(a) 1 (b) 2 (c) 3 (d) 4

10. The number of multiples of 4 between 10 and 250 is:

(a) 50 (b) 40 (c) 60 (d) 30

11. 20th term from the last term of the A.P. 3, 8, 13, ..., 253 is:

(a) 147 (b) 151 (c) 154 (d) 158

12. The sum of the first five multiples of 3 is:

(a) 45 (b) 55 (c) 65 (d) 75

13. The 10th term of the AP: 5, 8, 11, 14, ... is:

(a) 32 (b) 35 (c) 38 (d) 185

14. In an AP, if d = -4, n = 7, a_n = 4, then a is:

(a) 6 (b) 7 (c) 20 (d) 28

15. The list of numbers –10, –6, –2, 2, ... is:

(a) an AP with d = –16 (b) an AP with d = 4
(c) an AP with d = –4 (d) not an AP

16. If the 2nd term of an AP is 13 and the 5th term is 25, then its 7th term is

(a) 30 (b) 33 (c) 37 (d) 38

17. Which term of the AP: 21, 42, 63, 84, ... is 210?

(a) 9^{th} (b) 10^{th} (c) 11^{th} (d) 12^{th}

18. What is the common difference of an AP in which $a_{18} - a_{14} = 32$?

(a) 8 (b) -8 (c) -4 (d) 4

19. The famous mathematician associated with finding the sum of the first 100 natural numbers is:

(a) Pythagoras (b) Newton (c) Gauss (d)Euclid

20. The sum of first 16 terms of the AP: 10, 6, 2, ... is:

(a) –320 (b) 320 (c) –352 (d) –400

21. Find a, b and c such that the following numbers are in AP: a, 7, b, 23, c.

22. Determine the AP whose fifth term is 19 and the difference of the eighth term from the thirteenth term is 20.

23. The sum of the first five terms of an AP and the sum of the first seven terms of the same AP is 167. If the sum of the first ten terms of this AP is 235, find the sum of its first twenty terms.

24. Find the Sum of those integers from 1 to 500 which are multiples of 2 or 5.

25. An AP consists of 37 terms. The sum of the three middle most terms is 225 and the sum of the last three is 429. Find the AP.

26. Assertion: The 11th term of an AP is 7,9,11,13_____is 67

Reason: if Sn is the sum of first n terms of an AP then its nth term an is given by $a_n=S_n + S_{n-1}$

27. Assertion: If Sn is the sum of the first n terms of an A.P., then its nth term an is given by an=Sn−Sn−1.

Reason: The 10th term of the A.P. 5, 8, 11, 14, ... is 35.

28. The school auditorium was to be constructed to accommodate at least 1500 people. The chairs are to be placed in concentric circular arrangement in such a way that each succeeding circular row has 10 seats more than the previous one.

i. If the first circular row has 30 seats, how many seats will be there in the 10th row?
ii. For 1500 seats in the auditorium, how many rows need to be there?ORIf 1500 seats are to be arranged in the auditorium, how many seats are still left to be put after 10th row?
iii. If there were 17 rows in the auditorium, how many seats will be there in the middle row?

29. In the month of April to June 2022, the exports of passenger cars from India increased by 26% in the corresponding quarter of 2021–22, as per a report. A car manufacturing company planned to produce 1800 cars in 4th year and 2600 cars in 8th year. Assuming that the production increases uniformly by a fixed number every year.

Based on the above information answer the following questions.

i. Find the production in the 1st year.
ii. Find the production in the 12th year.
iii. Find the total production in first 10 years. OR
iv. In which year the total production will reach to 15000 cars?

Topic – Coordinate Geometry

1. The points (-1, –2), (1, 0), (-1, 2), (-3, 0) form a quadrilateral of type:

(a) Square (b) Rectangle (c) Parallelogram (d) Rhombus

2. If the distance between the points A(2, -2) and B(-1, x) is equal to 5, then the value of x is:

(a) 2 (b) -2 (c) 1 (d) -1

3. The midpoint of a line segment joining two points A(2, 4) and B(-2, -4) is:

(a) (-2, 4) (b) (2, -4) (c) (0, 0) (d) (-2, -4)

4. The distance of point A (2, 4) from the x-axis is

(a) 2 units (b) 4 units (c) -2 units (d) -4 units

5. The distance between the points P(0, 2) and Q(6, 0) is:

(a) $4\sqrt{10}$ (b) $2\sqrt{10}$ (c) $\sqrt{10}$ (d) 20

6. If O (p/3, 4) is the midpoint of the line segment joining the points P (-6, 5) and Q (-2, 3), the value of p is:

(a) 7/2 (b) -12 (c) 4 (d) -4

7. The point which divides the line segment of points P(-1, 7) and (4, -3) in the ratio of 2:3 is:

(a) (-1, 3) (b) (-1, -3) (c) (1, -3) (d) (1, 3)

8. The ratio in which the line segment joining the points P(-3, 10) and Q(6, –8) is divided by O(-1, 6) is:

(a) 1:3 (b) 3:4 (c) 2:7 (d) 2:5

9. The coordinates of a point P, where PQ is the diameter of a circle whose centre is (2, – 3) and Q is (1, 4) is:

(a) (3, -10) (b) (2, -10) (c) (-3, 10) (d) (-2, 10)

10. The area of a rhombus whose vertices are (3, 0), (4, 5), (-1, 4) and (-2,-1) taken in order, is:

(a) 12 sq.units (b) 24 sq.units (c) 30 sq.units (d) 32 sq.units

11. The distance of the point P(−6, 8) from the origin is:

(a) 8 units (b) $2\sqrt{7}$ units (c) 10 units (d) 6 units

12. The distance between the points (0, 5) and (−5, 0) is:

(a) 5 units (b) $5\sqrt{2}$ units (c) $2\sqrt{5}$ units (d) 10 units

13. The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is:

(a) 5 (b) 12 (c) 11 (d) $7 + \sqrt{5}$

14. The area of a triangle with vertices (a, b + c), (b, c + a) and (c, a + b) is:

(A) $(a + b + c)^2$ (B) 0 (C) a + b + c (D) ab

15. The point which lies on the perpendicular bisector of the line segment joining the points A(−2, −5) and B(2, 5) is:

(a) (0, 0) (b) (0, 2) (c) (2, 0) (d) (−2, 0)

16. If the points A(1, 2), O(0, 0) and C(a, b) are collinear, then:

(a) a = b (b) a = 2b (c) 2a = b (d) a = −b

17. If the points A(6, 1), B(8, 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram, taken in order, then the value of p is:

(a) 4 (b) -6 (c) 7 (d) -2

18. A line intersects the y-axis and x-axis at the points P and Q, respectively. If (2, -5) is the midpoint of PQ, then the coordinates of P and Q are, respectively:

(a) (0, -5) and (2, 0) (b) (0, 10) and (-4, 0)

(c) (0, 4) and (-10, 0) (d) (0, -10) and (4, 0)

19. The perpendicular bisector of the line segment joining the points A(1, 5) and B(4, 6) cuts the y-axis at:

(a) (0, 13) (b) (0, −13) (c) (0, 12) (d) (13, 0)

20. The fourth vertex D of a parallelogram ABCD whose three vertices are A(–2, 3), B(6, 7) and C(8, 3) is:

(a) (0, 1) (b) (0, –1) (c) (–1, 0) (d) (1, 0)

21. Check whether (5, – 2), (6, 4) and (7, – 2) are the vertices of an isosceles triangle.

22. If Q (0, 1) is equidistant from P (5, – 3) and R (x, 6), find the values of x. Also, find the distance QR and PR.

23. Name the type of quadrilateral formed, if any, by the following points, and give reasons for your answer:

(i) (- 1, – 2), (1, 0), (- 1, 2), (- 3, 0)

(ii) (- 3, 5), (3, 1), (0, 3), (- 1, – 4)

(iii) (4, 5), (7, 6), (4, 3), (1, 2)

24. Find the point on the x-axis which is equidistant from (2, – 5) and (- 2, 9).

25. Find the coordinates of the point which divides the join of (- 1, 7) and (4, – 3) in the ratio 2:3.

26. Find the coordinates of the points of trisection of the line segment joining (4, -1) and (-2, -3).

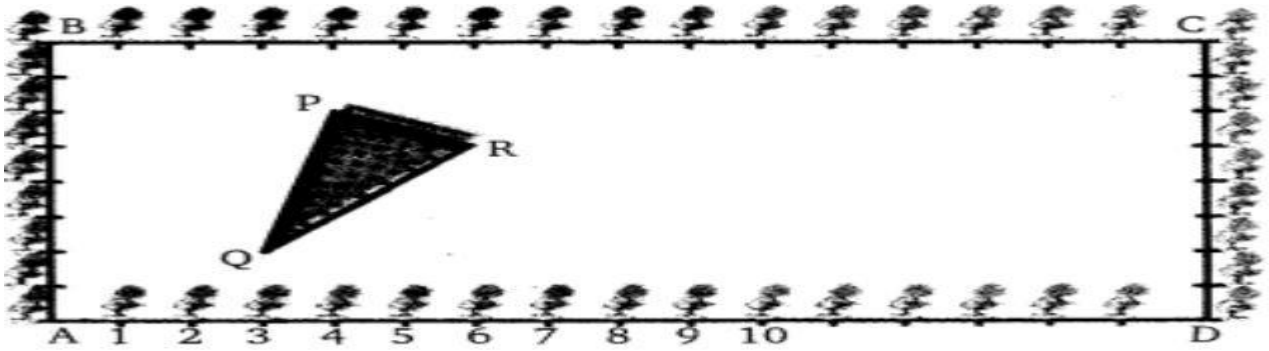
27. Find the ratio in which the line segment joining the points (-3, 10) and (6, – 8) is divided by (-1, 6).

28. Assertion: Ratio in which the line 3x + 4y = 7 divides the line segment joining the points (1, 2) and (- 2, 1) is 3 : 5

Reason: The coordinates of the point P(x, y) which divides the line segment joining the points $A(x_1, y_1)$ and $B(x_2, y_2)$ in the ratio $m_1 : m_2$ is

$$\left(\frac{m_1x_2+m_2x_1}{m1+m2}, \frac{m_1y_2+m_2y_1}{m1+m2}\right).$$

29. The class X Students school in Krishna Nagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.



i. Taking A as origin, find the coordinates of P

a) (4,6) b) (6,4) c) (0,6) d) (4,0)

ii. What will be the coordinates of R, if C is the origin?

a) (8,6) b) (3,10) c) (10,3) d) (0,6)

iii. What will be the coordinates of Q, if C is the origin?

a) (6,13) b) (-6,13) c) (-13,6) d) (13,6)

iv. Calculate the area of the triangles if A is the origin

a) 4.5 b) 6 c) 8 d) 6.25

v. Calculate the area of the triangles if C is the origin

a) 8 b) 5 c) 6.25 d) 4.5

30. In a GPS, The lines that run east-west are known as lines of latitude, and the lines running north-south are known as lines of longitude. The latitude and the longitude of a place are its coordinates and the distance formula is used to find the distance between two places. The distance between two parallel

lines is approximately 150 km. A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri (P) via Bhuj (B) and Nashik (N) as shown in the given figure below.

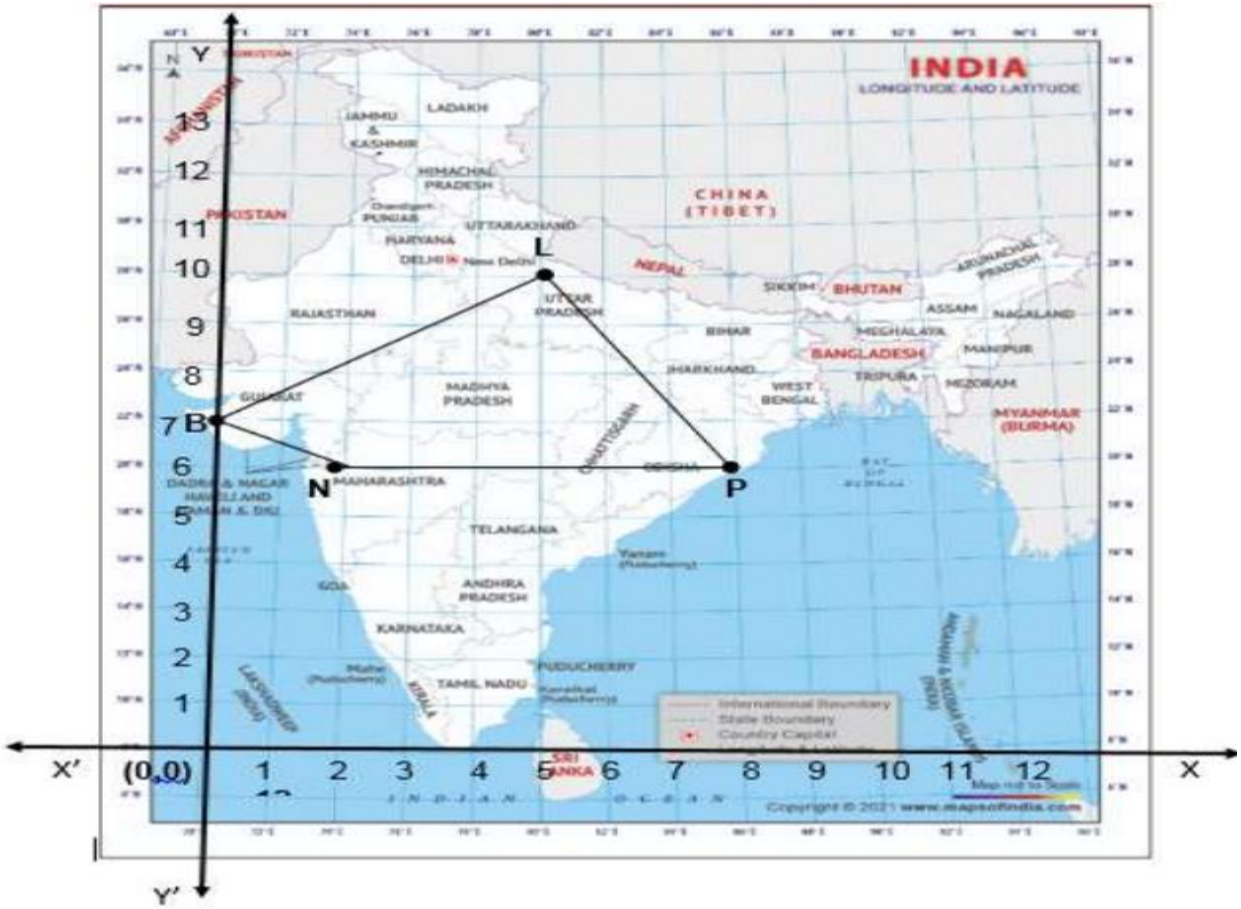
Based on the below information answer the following questions using the coordinate geometry.

(i) Find the distance between Lucknow (L) to Bhuj(B).

(ii) If Kota (K), internally divide the line segment joining Lucknow (L) to Bhuj (B) into 3 : 2 then find the coordinate of Kota (K).

(iii) Name the type of triangle formed by the places Lucknow (L), Nashik (N) and Puri (P) **OR**

(iv) Find a place (point) on the longitude (y-axis) which is equidistant from the points Lucknow (L) and Puri (P).



Additional questions:

1. Practice and write all the examples given in chapter 2,3,4,5,7 and 8 of NCERT book in your notebook.

2. Learn and write the formulae and facts given as what we discussed on last page of chapter 2,3,4,5,7 and 8 of NCERT book in your notebook.

3. Write the biographies of Euclid and Carl Fredric Gauss and explain their contribution in the field of mathematics.

4. Activity –

(A) Draw the graph of a quadratic polynomial and observe:

(i) The shape of the curve when the coefficient of x^2 is positive.

(ii) The shape of the curve when the coefficient of x^2 is negative.

(iii) Its number of zeroes.

MATERIAL REQUIRED - Graph paper, ruler, pencil, eraser, pen, glue.

(B) Verify the conditions of consistency/ inconsistency for a pair of linear equations in two variables by graphical method.

MATERIAL REQUIRED - Graph paper, ruler, pencil, eraser, pen, glue.

(C) Verify the distance formula by graphical method.

MATERIAL REQUIRED - Graph paper, ruler, pencil, eraser, pen, glue.