



ADRIEL HIGH SCHOOL

A CBSE Affiliated English Medium Co-Education Senior Secondary School

Pocket-2, Sector 24, Rohini, Delhi-110085

SUMMER VACATION HOME ASSIGNMENT

CLASS-X



Dear Parents and Students,

Summer Vacation is at our doorsteps. Holidays are a well-deserved opportunity to relax and rewind by indulging in activities that are pleasurable and at the same time educative. Holidays' Home work has been designed to fire your imagination, to make you explore, discover and reinvent many things.

As parents, kindly motivate and lend support to your children and ensure that they complete the given work well-in-time and to the best of their ability.



ENGLISH

1. Write character sketch of any two of the following in 100 - 120 words.
a) Lencho b) Nelson Mandela c) James Herriot
2. Write your experience about any two places that you have visited during your summer vacations if possible also paste some pictures related to the same.
3. Write step by step how to cook 'Maggi'.
4. Write down 20 proverbs and homonyms with their meanings and their uses.
5. Write a script on any 'Social Issue' it should be divided into four scenes. Name of the characters should be mentioned properly.

(Note- Do all work on A-4 size sheet and place them in a folder.)

HINDI

1. पोर्टफोलियो विषय (नेताजी सुभाष चंद्र बोस का एक अद्भुत व्यक्तित्व)
2. 'गोस्वामी तुलसीदास' अथवा 'सूरदास' या 'जयशंकर प्रसाद' पर (16पृष्ठ) का परियोजना कार्य तैयार करें।

MATHS

1. Complete the following Assignment in a separate notebook.

Polynomials

Introduction

The expression of the type $p(x) = a_0 + a_1x + a_2x^2 + a_3x^3 + \dots + a_{n-1}x^{n-1} + a_nx^n$. where $a_0, a_1, a_2, a_3, a_4, \dots, a_n$ are real numbers called coefficients of the polynomial and n is any non-negative integer. The greatest exponent of the variable is called the degree of the polynomial.

A polynomial of degree zero is called a constant polynomial. For example

$$p(x)=3, \quad p(y)=-5, \quad p(t)=-23$$

A polynomial of degree one is called a linear polynomial. For example

$$p(x)=5x+4,$$

$$p(y)=-7y+3, \quad p(t)=15t-17$$

A polynomial of degree two is called a quadratic polynomial. For example

$$p(x)=3x^2-4x+6, \quad p(y)=2y^2+5y-9$$

A polynomial of degree three is called a cubic polynomial. For example

$$p(x)=x^3-4x^2+5x+7, \quad p(y)=y^3-4y^2+y+12.$$

Zeros of the Polynomial

Those real values of the variable for which the value of the polynomial becomes zero are called the zeroes of the polynomial. If $p(x)=0$ at $x=3$, then $x=3$ is called the zero of the polynomial. A quadratic polynomial can have either two distinct zeroes, two equal zeroes or no zeroes. This also means that a polynomial of degree two has at most two zeroes. Similarly we can say that a cubic polynomial can have at the most three distinct real zeroes but at least one real zero is certain. Therefore, In general, polynomial of degree n can have at the most n zeroes.

Relationship b/w Zeroes and Coefficients

If α, β be the zeroes of the quadratic polynomial $p(x)=ax^2+bx+c$, ($a \neq 0$), then $\alpha + \beta = \frac{-b}{a}$ and $\alpha\beta = \frac{c}{a}$. A similar relationship holds b/w the zeroes of a cubic polynomial and its coefficients.

If α, β, γ be the zeroes of the cubic polynomial $p(x)=ax^3+bx^2+cx+d$, ($a \neq 0$), then $\alpha + \beta + \gamma = \frac{-b}{a}$, $\alpha\beta + \beta\gamma + \alpha\gamma = \frac{c}{a}$ and $\alpha\beta\gamma = \frac{-d}{a}$.

Division Algorithm for Polynomials

When a polynomial $p(x)$ is divided by another non-zero polynomial $g(x)$, then there exists two polynomials $q(x)$ and $r(x)$ such that $p(x)=q(x).g(x)+r(x)$.

Assignments:

1.If -1 and -2 are the zeroes of the cubic polynomial $p(x)=x^3-2x^2+ax+b$, find the values of a and b .

2.Find the zeroes of the following polynomials and verify the relationship b/w the zeroes and its coefficients.

- (i) $x^2+8x+15$ (ii) x^2-9 (iii) $2y^2-y-6$ (iv) $4z^2-4z+1$
(v) $4x^2+16x$ (vi) $3y^2-10y-8$ (vii) $2x^2-3x-9$ (viii) $2\sqrt{5}y^2+y-3\sqrt{5}$

3.If α, β be the zeroes of the quadratic polynomial $p(x)=x^2-ax+b$, then find the values of

(i) $\frac{1}{\alpha} + \frac{1}{\beta}$ (ii) $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ (iii) $\alpha^2 + \beta^2$ (iv) $\alpha^3 + \beta^3$ (v) $\frac{\alpha}{\beta^2} + \frac{\beta}{\alpha^2}$

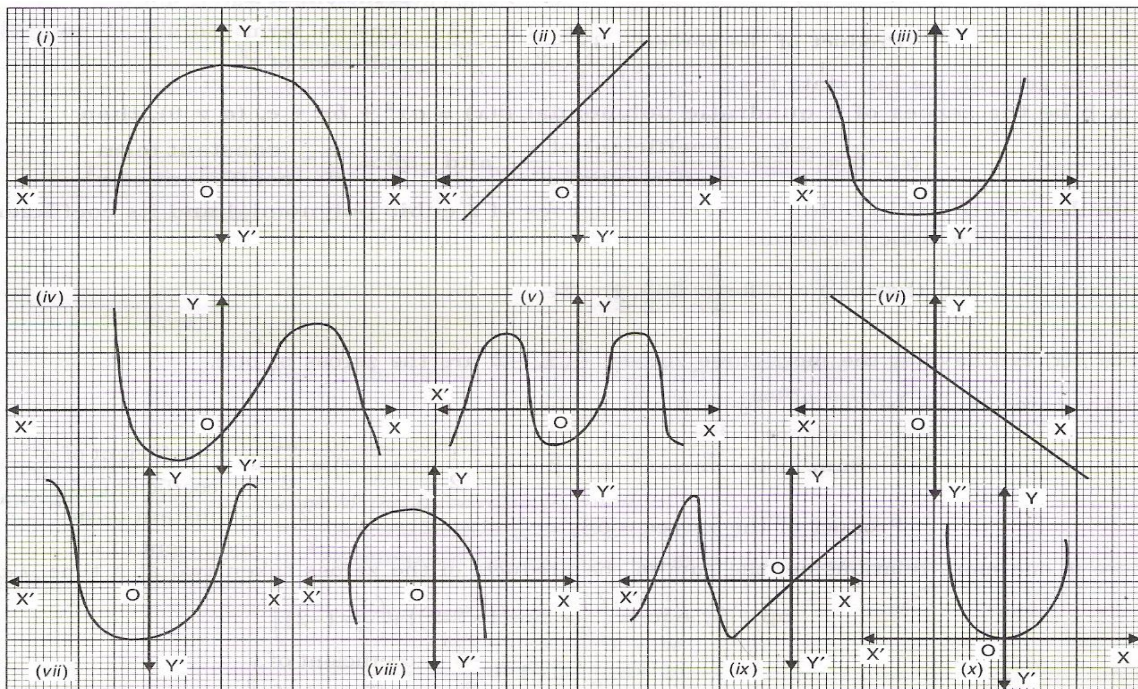
4. Find the zeroes of the quadratic polynomial $p(x) = acx^2 + (ab - c^2)x - bc$ and verify the relationship b/w the zeroes and its coefficients.

5. Find a if the sum of squares of the zeroes of the polynomial $p(x) = x^2 + 7x - a$ is 25.

6. If α, β be the zeroes of the quadratic polynomial $p(x) = x^2 - (k+6)x + 2(2k-1)$, then find the value of k , if $\alpha + \beta = \frac{1}{2}\alpha\beta$.

7. Find the zeroes of the polynomial $p(x) = x^3 - 3x^2 - 4x + 12$, if two of its zeroes are equal in magnitude but opposite in sign.

8. Look at the graphs given below of the polynomial $y = p(x)$. Find the number of zeroes in each polynomial.



9. Find the zeroes of the polynomial $x^2 + 7x + 12$, and verify the relation b/w the zeroes and the coefficients.

10. Find the zeroes of the following polynomials and verify the relation b/w the zeroes and the coefficients:

(i) $6x^2 - 3$ (ii) $4x^2 + 8x$ (iii) $t^2 - 15$

11. Find the quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively

(i) $\frac{1}{4}, -1$ (ii) $\sqrt{2}, \frac{1}{3}$ (iii) $0, \sqrt{5}$

12. Find the zeroes of the polynomial $f(x) = 4\sqrt{3}x^2 + 5x - 2\sqrt{3}$, and verify the relationship between the zeroes and coefficients.

13. If α and β are the zeroes of the polynomial $f(x) = kx^2 + 4x + 4$ such that $\alpha^2 + \beta^2 = 24$, find the values of k .

14. Find all the zeroes of the polynomial $f(x) = 2x^4 - 2x^3 - 7x^2 + 3x + 6$, if its two zeroes are $-\sqrt{\frac{3}{2}}$ and $\sqrt{\frac{3}{2}}$.

15. If the polynomial $f(x) = x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be $x + a$, find k and a .

16. If α and β are the zeroes of the polynomial $f(x) = x^2 + px + q$, find the polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$

Answers:

1. $a = -13, b = -10$

2. (i) $-5, -3$ (ii) $3, -3$ (iii) $2, \frac{-3}{2}$ (iv) $\frac{1}{2}, \frac{1}{2}$ (v) $0, -4$ (vi) $4, \frac{-2}{3}$

(vii) $3, \frac{-3}{2}$ (viii) $\frac{\sqrt{5}}{2}, \frac{-3}{\sqrt{5}}$

3. (i) $\frac{a}{b}$ (ii) $\frac{a^2 - 2b}{b}$ (iii) $a^2 - 2b$ (iv) $a(a^2 - 3b)$ (v) $\frac{a(a^2 - 3b)}{b^2}$

4. $\frac{c}{a}, \frac{-b}{c}$ 5. -12 6. $k = 7$ 7. $2, -2, 3$

Linear Equations

Introduction

Equation of the form $ax + by + c = 0$ where $a, b, c \in R$, is called a linear equation, where a, b, c are called coefficients of this equation. Pair of such equations is called system of equations.

Methods of Solving System of Equations:

- (a) Graphical method
- (b) Algebraic method

Graphical Method: Consider two linear equations,

$$a_1x + b_1y + c_1 = 0 \quad \text{and} \quad a_2x + b_2y + c_2 = 0$$

Draw the graphs of the above linear equations. If graphs of two equations

- (i) intersect each other at a point (α, β) , then the equations are consistent with unique solution $x = \alpha$ and $y = \beta$
- (ii) are coincident, then the equations are consistent with infinitely many solutions.
- (iii) are parallel, then the equations are inconsistent i.e. no solution.

Algebraic Method:

- (i) Elimination by substitution
- (ii) Elimination by equating the coefficients
- (iii) Cross multiplication method

Conditions for solvability:

- (a) If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$, then the equations are consistent with unique solution $x = \alpha$ and $y = \beta$ and lines are intersecting.
- (b) If $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$, then the equations are consistent with infinitely many solutions and lines are coincident.
- (c) If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$, then the equations are inconsistent i.e. no solution and lines are parallel.

Assignments:

1. Solve the following pair of linear equations by substitution method:

(i)
$$\begin{aligned} 3x + 2y - 5 &= 0 \\ 6x - 5y - 1 &= 0 \end{aligned}$$

(ii)
$$\begin{aligned} x - 4y &= 13 \\ 3x + 2y &= -3 \end{aligned}$$

(iii)
$$\begin{aligned} 5x + 8y &= 9 \\ 2x + 3y &= 4 \end{aligned}$$

2. Solve the following pair of linear equations by elimination method:

(i)
$$\begin{aligned} 7x + 11y &= 3 \\ 8x + y &= 15 \end{aligned}$$

(ii)
$$\begin{aligned} 5x - 6y + 9 &= 0 \\ 3x + 4y - 25 &= 0 \end{aligned}$$

(iii)
$$\frac{x}{3} + \frac{y}{4} = 6, \quad \frac{x}{6} + \frac{y}{2} = 6$$

3. By cross multiplication method solve the following pair of equations:

$$\begin{array}{lll}
 \text{(i)} & 11x+15y+23=0 & \text{(ii)} \quad ax+by=a-b \\
 & 7x-2y-20=0 & bx-ay=a+b \\
 \text{(iv)} & \frac{x+3}{2}-\frac{y+2}{7}=1 & \text{(v)} \quad \frac{x+1}{2}+\frac{y-1}{3}=8 \\
 & \frac{x+2}{11}+\frac{y+3}{11}=1 & \frac{x-1}{3}+\frac{y+1}{2}=9 \\
 & & \text{(vi)} \quad 3x+2y=\frac{11}{3} \\
 & & -7x+5y=\frac{31}{3}
 \end{array}$$

4. Solve the following pair of linear equations graphically:

$$\begin{array}{lll}
 \text{(i)} & 3x+2y=8 & \text{(ii)} \quad 3x-y=7 \\
 & 4x-5y=3 & 5x+6y=4 \\
 \text{(iv)} & 3x-2y=4 & \text{(vi)} \quad 4x-3y+7=0 \\
 & 5x-2y=0 & 3x-5y=-18 \\
 & & 5x+6y-1=0
 \end{array}$$

5. Draw the graphs of the pair of linear equations

$$3x+2y-13=0, \quad 2x+3y-12=0$$

and find the coordinates of the points where these lines meet (i) the x-axis
(ii) the y-axis.

6. Find graphically the coordinates of the vertices of the triangle formed by the lines

$$x+2y-3=0, \quad 3x-2y+7=0 \text{ and } y+1=0.$$

7. Solve each of the following pair of linear equations

$$\begin{array}{lll}
 \text{(a)} & \frac{4y-6x}{xy}=1 & \text{(b)} \quad \frac{5}{x-1}+\frac{1}{y-2}=2 \\
 & \frac{3y+4x}{xy}=5 & \frac{6}{x-1}-\frac{3}{y-2}=1 \\
 \text{(c)} & \frac{44}{x+y}+\frac{30}{x-y}=10 & \\
 & \frac{55}{x+y}+\frac{40}{x-y}=13 &
 \end{array}$$

$$\begin{array}{ll}
 \text{(d)} & 31x+43y=117 \\
 & 43x+31y=105 \\
 \text{(e)} & 148x+231y=527 \\
 & 231x+148y=610
 \end{array}$$

8. For what value of k will the pair of equations
 $kx+3y-(k-3)=0$ and $12x+ky-k=0$, have infinitely many solutions.

9. For what value of k will the pair of equations
 $(3k+1)x+3y-2=0$ and $(k^2+1)x+(k-2)y-5=0$, have no solution.

10. A part of monthly hostel charges is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 20 days, he has to pay Rs 1000 as hostel charges whereas a student

B, who takes food for 26 days pays Rs 1180 as hostel charges. Find the fixed charge and the cost of food per day.

11. The taxi charges in a city comprise of a fixed charge together with the charge for the distance covered. For a journey of 10 km, the charges paid are Rs 75 and for a journey of 15 km, the charges paid are Rs 110. What will a person have to pay for travelling a distance of 25 km ?

12. A man travels 600 km partly by train and partly by car. If he covers 400 km by train and the rest by car, it takes him 6 hours and 30 minutes. But if he travels 200km by train and the rest by car, he takes half an hour longer. Find the speed of the train and that of the car.

13. A two digit number is 4 times the sum of its digits. If 18 is added to the number, the digits are reversed. Find the number.

14. The sum of a two digit number and the number obtained by reversing the order of its digits is 99. If the digits differ by 3, find the number.

15. The sum of a two digit number and the number formed by interchanging the digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits in the first number. Find the first number.

16. Two years ago a father was five times as old as his son. Two years later, his age will be 8 years more than three times the age of the son. Find the present ages of father and son.

17. The sum of the digits of a two digit number is 15. The number obtained by interchanging the digits exceeds the given number by 9. Find the number.

18. The monthly incomes of A and B are in the ratio of 9 : 7 and their monthly expenditures are in the ratio of 4 : 3. If each saves Rs 1600 per month, find the monthly incomes of each.

19. A number consisting of two digits is equal to 7 times the sum of its digits. When 27 is subtracted from the number, the digits interchange their places. Find the number.

20. The area of a rectangle gets reduced by 80 sq units if its length is reduced by 5 units and the breadth is increased by 2 units. If we increase the length by 10 units and decrease the breadth by 5 units, the area is increased by 50 sq units. Find the length and breadth of the rectangle.

21. Places A and B are 80 km apart from each other on a highway: A car starts from A and another from B at the same time. If they move in the same direction, they meet in 8 hours and if they move in opposite directions they meet in 1 hour 20 minutes. Find the speeds of the cars.

Answers:

1. (i) $x=1, y=1$ (ii) $x=1, y=-3$ (iii) $x=5, y=-2$ 2. (i) $x=2, y=-1$ (ii) $x=3, y=4$ (iii) $x=12, y=8$
3. (i) $x=2, y=-3$ (ii) $x=1, y=-1$ (iii) $x=-1, y=0$ (iv) $x=1, y=5$ (v) $x=7, y=13$
(vi) $x=-\frac{7}{87}, y=\frac{170}{87}$
4. (i) $x=2, y=1$ (ii) $x=2, y=-1$ (iii) $x=2, y=3$ (iv) $x=-2, y=-5$ (v) $x=-1, y=3$ (vi) $x=-1, y=1$
5. (i) $\left(\frac{13}{3}, 0\right), (6, 0)$ (ii) $\left(0, \frac{13}{2}\right), (0, 4)$ 6. $(-1, 2), (-3, -1), (5, -1)$
7. (a) $x=1, y=2$ (b) $x=4, y=5$ (c) $x=8, y=3$ (d) $x=1, y=2$ (e) $x=2, y=1$
8. $k=6$ 9. $k=-1$ 10. Rs.400, Rs 30 11. Rs. 180 12. 100 km/h, 80 km/h 13. 24 14. 63 or 36 15. 64
16. 42 yrs. 10 yrs. 17. 78 18. Rs. 14400, Rs. 11200 19. 63
20. 40, 30
21. 35 km/h, 25 km/h

SCIENCE

1. Do the written work and draw diagrams of discussed experiments in the practical file.
2. Do Write ups on the Topics allotted from Management of Natural Resources.
3. Do four numericals regarding lens formula.
4. Do practice of Ray Diagrams.
5. Make an Analytical table of lens, types and power of glasses worn by your family members or your neighbour.

SOCIAL SCIENCE

1. Mark the following in outline map of India:
(Note- Use different map for different topics)

LIST OF MAP ITEMS

History :Nationalism in India

- I. Congress sessions: • 1920 Calcutta • 1920 Nagpur • 1927 Madras session
- II. 3 Satyagraha movements: • Kheda • Champaran • Ahmedabad mill workers
- III. Jallianwala Bagh
- IV. Dandi March

Geography

I. Resources and Development: Identify Major Soil Types

II. Water Resources :Locating and Labeling: • Salal • Bhakra Nangal • Tehri • Rana Pratap Sagar • Sardar Sarovar • Hirakund • Nagarjun Sagar • Tuhgabhadra

III. Agriculture : Identify: • Major areas of Rice and Wheat • Largest/Major producer states of Sugarcane, Tea, Coffee, Rubber, Cotton and Jute

2. Prepare a beautiful project file on the topic 'Consumer Awareness' OR 'Social Issues' OR 'Sustainable Development'.

ARTIFICIAL INTELLIGENCE

1.->Chat with a chatbot on a messaging app or website (e.g., Google Assistant, ChatGPT Playground).

->Ask the chatbot questions about weather, news, or fun facts.

->Write down the chatbot's responses and your thoughts on the conversation.

2.Try Image Search:

->Use an image search engine like Google Images.

->Search for different objects or animals and observe the results.

->Note how accurate the search results are and any interesting findings.

3.Use Voice Commands:

->Use voice commands on your smartphone or computer (e.g., Google Voice Search, Siri).

->Ask it to perform tasks like setting a reminder, playing music, or telling a joke.

->Record your experience, including how well it understood your commands and if it was helpful.

4.Watch a Video on AI:

->Watch a short video or tutorial about artificial intelligence basics on platforms like YouTube.

->Take notes on the main ideas discussed and any new terms you learned.

->Write a summary of what you found most interesting or surprising in the video.

Submission Requirements:

Write a short paragraph for each task describing your experience and any insights gained.

*******HAPPY HOLIDAYS*******