Autumn Break (20.10.2023 to 29.10.2023)

Home work

Class - 11th C

Accountancy :-

1. Depreciation chapter
   Exercise sums 1 to 18.
2. MCQ - 50 from chapter 1 to chapter Depreciation.
3. Project on any one topic as per syllabus.

Business Studies :-

1. Write any 50 MCQs from lesson 1 to lesson 6.
2. Project on any topic as per syllabus

Class - 12th

Accountancy :-

1. Completion of project
2. Daily 5 Question from Chapter 'Share Capital'.
3. Write 50 MCQs from first 2 books.

Business Studies

1. Completion of project
2. Write 2 case based Questions from each lesson.
3. Write 5 MCQs from each lesson.

गृह कार्य

कक्षा –दसवी

१) रचना के आधार पर वाक्य भएद–
सरल वाक्य, संयुक्त वाक्य, मिश्र वाक्य
(तीनो वाक्यौ के पांच -पाच वाक्य बनाए)

२) वाच्य परिवर्तन

कर्म वाच्य, भाव वाच्य, कतृ वाच्य

(तीनो के पांच –पाच वाक्य बनाए)

३) पद परिचय
वाक्य में प्रयुक्त पदों का परिचय दीजिए
१) सोनिया पर पत्र लिखतीं है।
२) मानसी और उसका भाई दोनों तेज़ दौड़ते हैं।
३) हम बाग़ में गएँ परंतु वहां कोई न मिला।

४) अलंकार
प्रत्येक अलंकार के दो- दो उदाहरण दीजिए
उत्प्रेक्षा, श्लेष, अतिशयोक्ति, मानवीकरण अलंकार

Holiday assignment class VIII
2023

- India's Mega Companies

Collect deatil information about following companies which are back bone of India's industrial growth.

A) TATA industries.
B) Reliance industries.

Points to be covered .

1) Who started it?
2) How many sub companies are operating under them.
3) Their business
4) Products made by them
5) Sectors in which they are working.
6) Market capitalisation/ worth
7) Their contribution in Indian economy.
8) Employment generation by both companies.
9) Their foreign plants.
10) Significance in India's overall growth.
11) Secret behind their success.

Submission date - 1st Nov 2023

Class 'IX' Holiday assignment (SST)

2023

Project (Informative data accumulation exercise)

- Indian Railways (Journey since induction and it's future)

Points to be covered.

1) Invention
2) Beginning of Railways in India.
3) Development (tracks, locomotive)
4) Expansion of network
5) Projects(recently completed)
6) Operations (passenger ,commercial)
7) Future projects.
8) Compare with Japan, France and China's railway development.
9) Railways contribution to Indian economy.
10) Training and recruitment of railway personnel (procedures and training institutions.)
11) Your suggestions for development of futuristic railways in India.

KV No 1, Nausenabaugh

Autumn break 2023-Holiday Home work for class X

I. Read the text of the following chapters. Make at least 15 fill in the blanks from each chapter.
Complete this work in HW part in your social notes.
History: 1. The rise of nationalism in Europe
Geography: 1. Resources and development
Economics: 2. Sectors of Indian economy
Politics: 4. Political parties

II. Complete the project given on Assam – on chart paper

III. Map practice:
Locate the following places on outline map of India.
History:
Congress sessions – 1920, 1927 (3 places)
Satyagraha Movements- Kheda, Champaran, Ahmedabad, Jallianwallabagh, Dandi (6 places)
Geography:
Water resources: Salal, Bhakra Nangal, Tehri, Rana Pratap Sagar, Sardar Sarovar,
Hirakud, Nagarjuna Sagar, Tungabhadra (8 places)

_____

KENDRIYA VIDYALAYA NO1 NAUSENABAUGH

Class 8 Subject: SCIENCE

1.Prepare a chart or model of periodic table and learn their symbols and names.

2. Find out the locations of the deposits of Iron, Aluminum, Zinc, Copper and Gold in India.

Mark these in an outline map of India. In which form are the deposits found? Also write the

Uses of these metals.

3. Prepare a project on diseases caused by microbes in humans [any two diseases]. Mention-:

(a) Mode of Transmission. (b)Name of the microbes. (c)Symptoms and

(b)Methods of prevention & control (Paste pictures also).

4. Read and revise the topics covered in the class. Revision test will be conducted after vacation.

5.Get any one innovative idea for INSPIRE MANAK AWARD. Write the problem and how your idea will be able to solve it

KENDRIYA VIDYALAYA NO1 NAUSENABAUGH

Autum break holiday home work.

Class VII Subject Science

ANSWER THE FOLLOWING QUESTIONS (TO BE DONE ON CLASSWORK COPY)

1. Write the functions of different types of teeth in human beings.

2. 'A' got her gall bladder removed surgically as she was diagnosed with stones in Her gall bladder. After the surgery, she faced problems in digestion of certain food items When consumed in bulk. Can you tell which kind of food items would they be and why?

3. Boojho took some grains of boiled rice in test tube 'A' and Paheli took boiled and Chewed rice in test tube 'S'. Both of them poured 1-2 drops of iodine solution into theTest tube and observed the color change. What color change would they have Observed? Give reasons for your Answer.
4. Boojho and Paheli were eating their food hurriedly so that they could go out and Play during the recess. Suddenly, Boojho started coughing violently. Think of the Reasons, why he was coughing and discuss with your friends?
5. Draw the labeled diagram of tongue showing different region for taste buds.
6. Little Rishi (student of class VI) was watching his favourite cartoon serial on Television. Suddenly he got hiccups. His elder brother Shubham who was sitting nearby Him gave him a glass of water and suggested not to eat too fast in a hurry. Little Rishi Got confused as he had heard that 'hicki' comes when someone remembers. He asked His father. His father smiled and explained him that it is only a myth. He also explained

Him the proper scientific reason behind it.

(a) What is hiccup?
(b) Why do we get hiccup?

© What are the values shown by Rishi? [Value Based Question]

7. Define oral rehydration solution and when it is given to the patient? How can you prepare ORS at home?

II Make notes of our environment chapter.

III Solve these questions in hw notebook

1. In the equations given below, state giving reasons, whether substances have been oxidised

Or reduced.

(i) PbO + CO -> Pb + CO2 (ii) H2S + Cl2->2HCl + S.

2. What are the characteristics of chemical reactions?
3. What happens when an aqueous solution of sodium sulphate reacts with an aqueous

Solution of barium chloride? State the physical conditions of reactants in which the reaction

Between them will not take place. Write the balanced chemical equation for the reaction and

Name the type of reaction.

4. AgN03(aq) + NaCl(aq)————> AgCl(s)4↓ + NaN03(aq)

FeS + H2S04——> FeS04 + H2S↑

Consider the above mentioned two chemical equations with two different kinds of arrows

(↑and ↓) along with product. What do these two different arrows indicate?

5. Balance the following chemical equations. (PbNO3)2 →PbO + NO2 + O2
6. Assertion (A) : Following is a balanced chemical equation for the action of steam on iron :

3Fe + 4H2O → Fe3O4 + 4H2

Reason ®: The law of conservation of mass holds good for a chemical equation.

(a) Both (A) and ® are true and reason ® is the correct explanation of the assertion (A)

(b) Both (A) and ® are true, but reason ® is not the correct explanation of the assertion

(A).

© (A) is true, but ® is false.

(c) (A) is false, but ® is true.

7. Write balanced chemical equations for the following chemical reactions:

(a) Hydrogen + Chlorine → Hydrogen chlorid

(b) Lead + Copper chloride → Lead chloride + Copper

(c)Zinc oxide + Carbon → Zinc + Carbon monoxide

8. Mention with reason the colour changes observe when:

(i) Silver chloride is exposed to sunlight.

(ii) Copper powder is strongly heated in the presence of oxygen.

(iii) A piece of zinc is dropped in copper sulphate solution.

Kendriya Vidyalaya No.1, NSB,Visakhapatnam.

Mathematics Holiday Home Work (Autumn Break) -2023-24 for Class VII

(Very short Answer Type Questions – 1 mark)

1. A number which is in form of p/q is a rational number where p and q are _____ and q ____.
2. Every rational number can be represented as a _____ on the number line.
3. There are _____ rational numbers between two given rational numbers.
4. _____ is greater than any negative rational number. (-1,0)
5. Adding any two rational number the sum is a _____ number.

(Short Answer Questions – 2 marks)

6. Add: $\frac{-3}{4}+\frac{1}{5}$ 7. Find: $(\frac{-3}{4}) - \frac{2}{5}$ 8. Find the product: $(\frac{-3}{4})$ x $\frac{2}{9}$
9. Find: $(\frac{-1}{4}) \div \frac{7}{8}$.

(Short Answer Questions – 3 marks)

10. A Television company announced 10% discount on the occasion of festival. Mohan purchases a TV that costs Rs.15000. What is the discount allowed for him?
11. In class there are 40 students. On a particular day 80% students were present. How many students were absent?
12. A rectangular sheet of paper is $1\frac{1}{4}$ m. long and $\frac{3}{4}$ m. wide. Find its perimeter.
13. Arrange $\frac{2}{3}$, $\frac{-2}{9}$, $\frac{8}{21}$ in an ascending order.

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KENDRIYA VIDYALAYA NO.1, NSB, Visakhapatnam.

Holiday Home Work –Autumn Break (2023-24) Class : IX :: Subject: Mathematics

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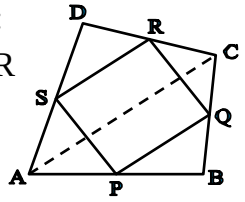
1. PQRS is a rectangle. What is the measure of ∠Q?
2. ABCD is a parallelogram. If ∠A = 35^0, then the measure of ∠B is...
3. The diagonals of a quadrilateral are equal and bisect each other at right angles. It is a ____
4. The diagonals of a quadrilateral are equal and bisect each other. It is a _____.
5. The diagonals of a quadrilateral are intersected at right angles. So, it is a _____.
6. Prove that a diagonal of a parallelogram divides it into two congruent triangles.
7. ABCD is a quadrilateral in which P, Q, R and S are mid-points of sides AB, BC, CD and DA respectively. AC is a diagonal. Show that:
   (i) SR ∥ AC and SR = ½ AC. (ii) PQ = SR
   (iii) PQRS is a parallelogram.



8. Show that the bisectors of angles of a parallelogram form a rectangle.
9. Show that the quadrilateral formed by joining the midpoints of sides of a rectangle is a rhombus.

Lab Activity: Prove that a diagonal of a parallelogram divides it into two congruent triangles by paper folding and cutting activity.

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KENDRIYA VIDYALAYA NO.1, NSB, Visakhapatnam.

Holiday Home Work –Autumn Break (2023-24) Class : IX :: Subject: Mathematics

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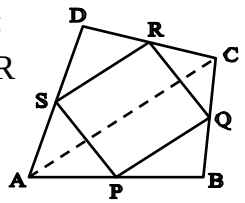

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KENDRIYA VIDYALAYA NO.1 NAUSENABAUGH, VISAKHAPATNAM-05

CLASS XII AUTUMN BREAK HOME WORK

(2023-24)

Relations and Functions:

1. Let A = N X N be the set of all ordered pairs of natural numbers and R be the relation on the set A defined by (a, b) R (c, d) iff ad = bc. Show that R is an equivalence relation
2. Let N denote the set of all natural numbers and R be the relation on NXN defined by $(a,b)R(c,d)$ if $ad(b+c) = bc(a+d)$. Show that R is an equivalence relation.
3. Show that the relation S in the set A = $\{x \in Z : 0 \leq x \leq 12\}$ given by S = {(a, b) : a, b ∈ Z, |a – b| is divisible by 3} is an equivalence relation.
4. Consider $f: R - \left\{-\frac{4}{3}\right\} \to R - \left\{\frac{4}{3}\right\}$ given by $f(x) = \frac{4x+3}{3x+4}$, show that f is one-one and onto.
5. Let f: N→N be defined by $f(n) = \begin{cases} \frac{n+1}{2}, & \text{if n is odd} \\ \frac{n}{2}, & \text{if n is even} \end{cases}$ for all n ∈ N. Find whether the function f is one-one or not and onto or not.

Matrices:

1. If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$ find $A^2 - 5A + 16I$
2. If $X\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} = \begin{bmatrix} -7 & -8 & -9 \\ 2 & 4 & 6 \end{bmatrix}$, then find the matrix X
3. If X and Y are 2X2 matrices, then solve the following matrix equations for X and Y.

   $2X + 3Y = \begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}, 3X + 2Y = \begin{bmatrix} 2 & 2 \\ 1 & 5 \end{bmatrix}$,
4. Express the matrix $\begin{bmatrix} 2 & 4 & -6 \\ 7 & 3 & 5 \\ 1 & -2 & 4 \end{bmatrix}$ as the sum of a symmetric and skew symmetric matrix.
5. Find area of the triangle with vertices (-2, 2),(1,5) and (6,-1) using determinants.

Determinants:

1. Solve the following system of equations, using matrix method : $5x - y + z = 4$, $3x + 2y - 5z = 2$, $x + 3y - 2z = 5$;

2. Given $A = \begin{pmatrix} 5 & 0 & 4 \\ 2 & 3 & 2 \\ 1 & 2 & 1 \end{pmatrix}, B^{-1} = \begin{pmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{pmatrix}$, compute $(AB)^{-1}$

3. Find the product of the matrices $\begin{pmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{pmatrix}\begin{pmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{pmatrix}$ and use it to solve the system of equations $x - y + z = 4$; $x - 2y - 2z = 9$; $2x + y + 3z = 1$.

4. Find the product of the matrices $\begin{pmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{pmatrix}\begin{pmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{pmatrix}$ and use it to solve the system of equations $x + 3z = 9, -x + 2y - 2z = 4, 2x - 3y + 4z = -3$.

5. Find the product of the matrices $\begin{pmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{pmatrix}\begin{pmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{pmatrix}$ and use it to solve the system of equations $x - y + z = 4, x - 2y - 2z = 9, 2x + y + 3z = 1$.

Continuity and Differentiability:

1. If the function f(x) defined as below is continuous at x=0 then find the value(s) of a:

$$f(x) = \begin{cases} \frac{1-cos4x}{x^2} & x < 0 \\ a & x = 0 \\ \frac{\sqrt{x}}{\left(\sqrt{16+\sqrt{x}}\right)-4} & x > 0 \end{cases},$$

2. Discuss the continuity and differentiability of the function $f(x) = |x - 3| + |x - 4|$.

3. If $y = (\tan^{-1} x)^2$, *then show that* $(x^2 + 1)^2 \frac{d^2y}{dx^2} + 2x(x^2 + 1)\frac{dy}{dx} = 2$

4. *If* $x = a(\cos t + t \sin t)$ *and* $y = a(\sin t - t \cos t)$, *find* $\frac{d^2y}{dx^2}$ at t=$\frac{\pi}{4}$.

5. If $y = (x)^{cosx} + (cosx)^{sinx}$, *find* $\frac{dy}{dx}$.

Applications of derivatives:

1. Determine the intervals in which the function $f(x) = x^4 - 8x^3 + 22x^2 - 24x + 21$ is strictly increasing or strictly decreasing.
2. Prove that $y = \frac{4sinx}{2+cosx} - x$ *is an increasing funtion of* x *on* $\left[0, \frac{\pi}{2}\right]$.
3. A wire of length 28 cm is cut into two pieces. One made into a square and the other into a circle. Find the lengths of the two pieces so that the combined area of square and the circle is minimum.
4. The volume of a cube is increasing at the rate of 9 cm^3/s. How fast is its surface area increasing when the length of an edge is 10 cm ?
5. Show that the right circular cone of least curved surface and given volume has an altitude equal to $\sqrt{2}$ times the radius of the base.

Integrals:

1. Evaluate $\int \sqrt{x^2 - 4x + 13}\, dx$
2. Evaluate $\int \left[\log(logx) + \frac{1}{(logx)^2}\right] dx$
3. Evaluate $\int \frac{4}{(x-2)(x^2+4)}\, dx$
4. Evaluate $\int_1^5 \{|x-1| + |x-2| + |x-4|\} dx$
5. Evaluate $\int_0^{\frac{\pi}{4}} \log(1 + tanx)\, dx$

Applications of Integrals:

1. Using integration, find the area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
2. Find the area of the circle enclosed by the circle $x^2 + y^2 = 144$.

Differential Equations:

1. Solve the differential equation : $tany \sec^2 x\, dx + tanx \sec^2 y\, dy = 0$
2. Solve: $\text{ylogydx} - \text{xdy} = 0$
3. Solve : $\text{x}\frac{\text{dy}}{\text{dx}} + \text{y} = \text{x}^3$.
4. Show that $(x^2 + xy)\, dy = (x^2 + y^2) dx$ is homogeneous differential equation and solve the D.E.
5. Find the general solution of the differential equation.

   $(1 + x^2)\, dy + 2xy\, dx = \cot x\, dx\, , (x \neq 0)$

Vectors:

1. Let a = i +4j+2k, b = 3i –2j+7k and c = 2 i –j +4k. Find a vector d which is perpendicular to both a and b and c . d = 27
2. If a=i+2j+k, b=2i+j and c=3i–4j–5k, then find a unit vector perpendicular to both of the vectors (a–b) and (c–b).
3. Find the projection of the vector a = 2i + 3j + 2k on the vector b = 2i + 2j + k.
4. Find the area of the parallelogram whose adjacent sides are represented by the vectors
   $2\hat{\imath} - 3\hat{\jmath} + 4\hat{k}$, $\hat{\imath} + 2\hat{\jmath} + 3\hat{k}$.

Three Dimensional Geometry:

1. Find vector and Cartesian equations of a line passing through (1,2,-4) and perpendicular to the two lines $\frac{x-8}{3} = \frac{y+19}{-16} = \frac{z-10}{7}$ and $\frac{x-15}{3} = \frac{y-29}{8} = \frac{z-5}{-5}$.
2. Find the shortest distance between the lines whose vector equations are $\vec{r} = (\hat{\imath} + 2\hat{\jmath} + 3\hat{k}) + \mu(\hat{\imath} - 3\hat{\jmath} + 2\hat{k})$ and $\vec{r} = (4\hat{\imath} + 5\hat{\jmath} + 6\hat{k}) + t(2\hat{\imath} + 3\hat{\jmath} + \hat{k})$
3. Find the shortest distance between the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-2}{3} = \frac{y-4}{4} = \frac{z-5}{5}$.
4. Find the coordinates of the foot of perpendicular drawn from the point P(1, 8, 4) to the line joining the points A(0,-1, 3) and B(2,- 3,-1). Also find the length of this perpendicular.
5. Find the value of $p, so\ that\ the\ lines\ \frac{1-x}{3} = \frac{7y-14}{2p} = \frac{z-3}{1}$ and $\frac{7-7x}{3p} = \frac{5-y}{1} = \frac{11-z}{7}$ are right angles.

Linear Programing:

1. Solve the following Linear Programming problem graphically : Minimize : z = 6x + 3y Subject to the constraints : $4x + y \geq 80,\ x + 5y \geq 115, 3x + 2y < 150, x, y \geq 0$
2. Solve the following linear programming problem graphically : Minimize : z = 3x + 9y When: $x + 3y \leq 60, x + y \geq 10, x \leq y, x \geq 0, y \geq 0$
3. Maximise Z = x + 2y subject to the constraints $x + 2y \geq 100, 2x - y \leq 0$, $2x + y \leq 200, x, y \geq 0$. Solve the above LPP graphically.
4. Solve the following L.P.P. graphically : Minimize Z = 5x + 10y Subject to constraints $x + 2y \leq 120, x + y \geq 60$, $x - 2y \geq 0$, and x, y ≥0.
5. Solve the following LPP graphically : Maximise Z = 1000x + 600 subject to the constraints $x + y \leq 200,\ x \geq 20, y - 4x \geq 0, x, y \geq 0$.

KENDRIYA VIDYALAYA NO.1, NAUSENABAUGH, VISAKHAPATNAM

ACADEMIC SESSION 2023-24

CLASS -11 MATHEMATICS AUTUMN BREAK HOLIDAY HOME WORK

CHAPTER -1 SETS

1. If A={3,5,7,9,11},B={7,9,11,13},C={11,13,15} and D={15,17} then find the following (i) A ∩ (B ∪ D) (ii) A ∩ (B ∪ C) (iii) (A-B)U(C-D) (iv) A-(BUC)
2. If $\mu = \{1,2,3,4,5,6,7,8,9\}$, $A = \{2,4,6,8\}$ and $B = \{2,3,5,7\}$ then find $(A \cup B)'$ and $A' \cap B'$. What do you observe from these results?
3. Show that the following 4 conditions are equivalent
   $i) A \subset B$ $ii) A - B = \phi$ $iii) A \cup B = B$ $iv) A \cap B = A$
4. For any set A,B,C Prove that $A-(B \bigcap C) = (A-B) \bigcup (A-C)$
5. If A and B are any two sets Prove that $(A \bigcap B) \bigcup$ (A-B)=A
6. Let A,B and C be the sets such that $A \bigcup B = A \cup C$ and $A \bigcap B = A \bigcap C$. Show that B=C

CHAPTER -2 RELATIONS AND FUNCTIONS

1. If f and g are real valued functions defined by $f(x) = 2x - 1$ and $g(x) = x^2$ then find $(f+g)(x)$, $(f-g)(x)$, $(fg)(x)$ and $\left(\frac{f}{g}\right)(x)$.
2. Let A = {1, 2, 3, 4, 6}. Let R be the relation on A defined by {(a, b): a, b ∈A, b is exactly divisible by a}. (i) Write R in roster form (ii) Find the domain and the range of R.
3. Let N be the set of all natural numbers and let R={(a, b): a ,b∈N and 2a+b= 10}. Find its domain, range and co domain.
4. Draw rough graphs of the following functions
   (i) Signum function (ii) Modulus function (iii) greatest integer function.
   (ii) (iv)) $f(x) = x^2$ (v) $f(x) = x^3$
5. Find the domain and range of the following functions:

   (i) f(x) = |x| (ii) f(x) = $\frac{1}{x}$ (iii) f(x) = $\sqrt{x}$ (iv) $f(x) = \sqrt{16 - x^2}$

6. Find the domain of the function $f(x) = \frac{x^2+3x+5}{x^2-5x+4}$
7. Let A={1,2}, B={1,2,3,4}, C={5,6} and D= {5,6,7,8} verify that
   (a) $AX(B \cap C) = (AXB) \cap (AXC)$ (b) AXC is a subset of BXD
8. The relation f is defined by $f(x) = \begin{cases} x^2, & 0 \le x \le 3 \\ 3x, & 3 \le x \le 10 \end{cases}$ and the relation g is defined by $g(x) = \begin{cases} x^2, & 0 \le x \le 2 \\ 3x, & 2 \le x \le 10 \end{cases}$ then show that f is a function and g is not a function.

CHAPTER – 3 TRIGONOMETRTY

1. If in two circles, arcs of the same length subtend angles 60° and 75° at the centre, find the ratio of their radii.
2. If $\sec x = \frac{13}{5}$, x $lies$ in $fourth$ $quadrant$ then find the other five trigonometric functions.
3. If $sinx = \frac{3}{5}$, and x lies in second quadrant, then find cosx, tanx, cosecx, secx, cotx.
4. Prove that $\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$
5. Prove that: $\frac{sin7A + sin5A + sin9A + sin3A}{cos7A + cos5A + cos9A + cos9A} = tan6A$

6. Prove that $\cos 6x = 32cos^6x - 48\,cos^4x + 18cos^2x - 1$

7. Prove that $\cos 2x = \frac{1-\tan^2 x}{1+\tan^2 x}$

8. Find the value of $sin15^o$

9. Evaluate $cos(180° - \theta)sin\theta + sin(180° - \theta)cos\theta$

10. Prove that: $\cos^2 x + \cos^2\left(x + \frac{\pi}{3}\right) + \cos^2\left(x - \frac{\pi}{3}\right) = \frac{3}{2}$

11. Prove that $\frac{\cos 9x - \cos 5x}{\sin 17x - \sin 3x} = -\frac{\sin 2x}{\cos 10x}$

12. Show that tan 5x tan 3x tan 2x = tan 5x – tan 3x – tan 2x

13. cotx. cot2x – cot2x.cot3x – cot3x.cotx = 1.

14. Prove that $(\cos x + \cos y)^2 + (\sin x + \sin y)^2 = 4\cos^2\frac{x-y}{2}$.

15. Show that $cos\left(\frac{3\pi}{4} + x\right) - cos\left(\frac{3\pi}{4} - x\right) = -\sqrt{2}sinx.$

16. If tanx = $\frac{3}{4}$, x is in quadrant III, then find sin$\frac{x}{2}$, cos$\frac{x}{2}$ and tan$\frac{x}{2}$.

17. (a) Prove that $2\sin^2\frac{3\pi}{4} + 2\cos^2\frac{\pi}{4} + 2\sec^2\frac{\pi}{3} = 10$ (b) Find the value of $\tan\frac{\pi}{8}$

CHAPTER - 4 COMPLEX NUMBERS

1. Write the complex numbers in the standard form

(a) $3(7 + i7) + i(7 + i7)$ (b) $\frac{(3+i\sqrt{5})(3-i\sqrt{5})}{(\sqrt{3}+\sqrt{2}i)-(\sqrt{3}-i\sqrt{2})}$ (c) $\left(\frac{1}{1-4i} - \frac{2}{1+i}\right)\left(\frac{3-4i}{5+i}\right)$

2. Find the real and imaginary part of the complex number $\frac{1+3i}{2-3i}$

3. Find the conjugate of $\frac{(3-2i)(2+3i)}{(1+2i)(2-i)}$

4. Find the modulus of the complex numbers: $\frac{1+i}{1-i}$

5. Find the multiplicative inverse of $2 - 3i$.

6. If $Z_1 = 3 - 4i$ and $Z_2 = 2 + i$ find Re $(\frac{Z_1\bar{Z}_2}{Z_2})$

7. $If\ x + iy = \frac{a+ib}{a-ib}$ prove that $x^2 + y^2 = 1$

8. If $(x+iy)^3 = u + iv$, then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$.

9. If $\alpha, \beta\ are\ different\ complex\ numbers\ with\ |\beta| = 1\ then\ find\ |\frac{\beta-\alpha}{1-\bar{\alpha}\beta}|$.

10. Find the number of none zero integral solution of the equation $|1 - i|^x = 2^x$

CHAPTER -5 LINEAR INEQUATIONS

1. Write the solution for the integer x, if x + x/2 + x/3 ≤ 11

2. I.Q of a person is given by the formula $I.Q = \frac{M.\ A}{C.\ A}\ X\ 100$, where M.A is the mental age and C.A is the chronological age. If $80 \leq I.Q \leq 140$ for a group of 12 years children, find the range of their mental age?

3. To receive grade A in a course ,one must obtain an average of 90 marks or more in five examinations in five examinations (each of 100 marks).If Sunita"s marks in first four examinations are 87, 92, 94 and 95,find minimum marks that sunita must obtain in fifth examination to get grade A in the course.

4. Solve the inequality $\frac{(2x-1)}{3} \geq \frac{(3x-2)}{4} - \frac{(2-x)}{5}$
5. A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18%?
6. A solution is to be kept between $68^{\circ}F$ and $77^{\circ}F$. What is the range in temperature in degree Celsius (℃)if the celcius Fahrenheit (F) conversion formula is given by $F = \frac{9}{5}c + 32$?
7. Find all pairs of consecutive odd natural numbers, both of which are larger than 10, such that their sum is less than 40.
8. Solve the system of inequalities$3x - 7 < 5 + x$; $11 - 5x \leq 1$

CHAPTER – 6 PERMUTATIONS AND COMBINATIONS

1. How many four-digit numbers can be formed by using the digits 1 to 9 without repetition.
2. How many words, with or without meaning, can be formed using all the letters of the word EQUATION, using each letter exactly once?
3. Find the number of different 8 letter arrangements that can be made from the letters of the word 'DAUGHTER' so that (i) all vowels are occur together and (ii) all vowels do not occur together.
4. How many words, with or without meaning can be made from the letters of the word "MONDAY ", assuming that no letter is repeated, if (i) 4 letters are used at a time. (ii) all letters are used at a time. (iii) all letters are used but first letter is a vowel
5. In how many ways can the letters of the word PERMUTATIONS be arranged if the (i) words start with P and end with S (ii)vowels are all together.
6. How many 3- digit numbers can be formed from the digits 1,2,3,4 and 5 using (i) repetition of the digits is allowed? (ii) Repetition of the digits not allowed?
7. Find the number of arrangements of the letters of the word INDEPENDENCE. In how many of these arrangements (i)Do all the vowels always occur together. (ii)Do the words begin with I and end in P.
8. In how many ways can the letters of the word ASSASSINATION be arranged so that all the S's are together?
9. In how many ways can 5 girls and 3 boys be seated in a row so that no two boys are together?
10. A committee of 3 persons is to be constituted from a group of 2 men and 3 women. In how many ways can this be done? How many of these committees would consist of 1 man and 2 women?
11. A group consists of 4 girls and 7 boys. In how many ways can a team of 5members be selected if the team has (i) No girls (ii) At least one boy and one girl (iii) At least three girls. (iv) Exactly 2 boys.
12. In an examination, a question paper consists of 12 questions divided into two parts i.e; Part I and Part II, containing 5 and 7 questions, respectively. A student is required to attempt 8 questions in all, selecting at least 3 from each part. In how many ways can a student select the questions?
13. A school wants to celebrate an annual function in their school and a teacher has been given responsibility to organize the function. The teacher wants to form a committee of 7 students from a group of students consisting 4 girls and 9 boys to organize the annual function. In how many ways the committee can be selected consists of (i) exactly 3 girls (ii) at least 3 girls (iii) at most 3 girls (iv) with no girl (iv) 4 girls and 3 boys.

14. Ravi and Raju are friends. They spend leisure time by either reading books are playing games. Ravi is interested in chess whereas Raju in basketball. One fine evening, they were discussing about the playing cards and its details. Ravi picked 4 cards from the pack of 52 playing cards. In how many ways Ravi can pick (i) the four cards (ii) all four cards will be king (iii) All four are Spade (iv) all four are face cards (v) all four cards are of same colour (vi) four cards are the same suit (vii) four cards belong to four different suits (viii) two are red and two are black cards.

15. Determine the number of 5-card combinations out of a deck of 52 cards if each selection of 5 cards has exactly one kng?

16. In how many ways can one select a cricket team of eleven from 17 players in which only 5 players can bowl if each cricket team of 11 must include exactly 4 bowlers.

17. How many words with or without meaning, each of 2 vowels and 3 consonants can be formed from the letters of the word DUGHTER

18. If every body in room shakes hands with every body else .The total number of shake hands is 66.How many people are there in the room.

19. If $n_{C_9} = n_{C_8}$, find $n_{C_{17}}$.

20. Prove that ${}^{n}c_{r} + {}^{n}c_{r-1} = {}^{n+1}c_{r}$.

CHAPTER – 7 BINOMIAL THEOREM

1. Find the middle terms in the expansion $(3 - \frac{x^3}{6})^7$

2. In the expansion of $(1 + a)^{m+n}$, prove that the coefficients of a^m and a^n are equal.

3. Find $(a + b)^4 - (a - b)^4$. Hence evaluate $(\sqrt{3} + \sqrt{2})^4 - (\sqrt{3} - \sqrt{2})^4$

4. Find the term independent of x in the expansion of $\left(\sqrt[3]{x} + \frac{1}{2.\sqrt[3]{x}}\right)^{18}$, x>0.

5. Find the term independent of x in the expansion of$(\frac{3}{2}x^2 - \frac{1}{3x})^6$

6. If ${}^{n}C_{r-1}$=36,${}^{n}Cr$=84 and ${}^{n}C_{r+1}$=126,find the values of n and r.

7. The coefficients of the $(r-1)^{th}$, r^{th} and$(r+1)^{th}$ terms in the expansion of $(x+1)^n$ are in the ratio 1:3:5. Find n and r

8. The second, third and fourth terms in the expansion of $(x + a)^n$ are 240, 720 and 1080 respectively. Find n, x and a.

9. Find a, b, and n in the expansion of $(a + b)^n$ if the first three terms of the expansion are 729, 7290, and 30375 respectively.

10. Prove that the coefficient of x^n in the expansion of $(1 + x)^{2n}$ is twice the coefficient of x^n in the expansion of $(1 + x)^{2n-1}$

CHAPTER – 8 SEQUENCES AND SERIES

1. Find the 10^{th} term of the G.P. 5, 25, 125 ……

2. In a G.P., the 3rd term is 24 and the 6th term is 192.Find the 10th term.

3. If the 4^{th}, 10^{th} and 16^{th} terms of a G.P. are *x*, *y* and *z*, respectively. Prove that *x*,*y*, *z* are in G.P.

4. Find the value of x if 3, x, 27 are in G.P

5. The sum of two numbers is 6 times their geometric mean, show that the numbers are in the ratio $(3 + 2\sqrt{2}) : (3 - 2\sqrt{2})$

6. Find the sum of n terms of the sequence 8, 88, 888, 8888, ……

7. Find the sum of the series 0.7+0.77+0.777+---------- n terms.

8. Write the first five terms of the sequence whose n^{th} term is $a_n = (-1)^{n-1}.5^{n+1}$

9. How many terms of G.P. 3, 32 , 33 , … are needed to give the sum 120?

10. If a, b are the roots of $x^2 - 3x + p = 0$ *and* c, d are roots of $x^2 - 12x + q = 0$, where a, b, c, d form G.P. Prove that (q+p):(q-p)=17:15.

11. If a,b,c and d are in G.P. Show that $(a^2 + b^2 + c^2)(b^2 + c^2 + d^2) = (ab + bc + cd)^2$

12. If the first term and the nth term of a G.P. are a and b respectively and if P is the product of the first n terms, prove that $P^2 = (ab)^n$

13. If A.M. and G.M. of two positive numbers a and b are 10 and 8, respectively find the numbers.

14. Insert two numbers between 3 and 81 so that resulting sequence is in G.P.

15. Find the value of n so that $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ may be the geometric mean between a and b

16. If A and G be A.M and G.M respectively between two positive numbers, prove that the numbers are $A \pm \sqrt{(A+G)(A-G)}$

17. If A.M and G.M of roots of a quadratic equation are 8 and 5 respectively, then obtain the quadratic equation.

18. Let S be the sum , P be the product and R be the sum of reciprocals of n terms in a G.P then prove that $P^2R^n = S^n$

CHAPTER – 9 STRAIGHT LINES

1. The base of an equilateral triangle with side 2a lies along the y-axis such tht the mid-point of the base is at the origin. Find the vertices of triangle.

2. Find a point on the x-axis, which is equidistant from the points (7, 6) and (3, 4).

3. Find the equation of the straight line passing through the point (1,-2) and (2,3)

4. By using the concept of the line equation, prove that the three points (3, 0), (-2, -2) and (8,2) are collinear.

5. If three points (h, 0), (a, b) and (0, k) lie on a line, show that $\frac{a}{h} + \frac{b}{k} = 1$

6. Find the value of 'k' for which $(k, -1)$, $(2,1)$ and $(4,5)$ lie on the same line.

7. Find the angle between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$

8. Reduce the equation $x - \sqrt{3}y + 8 = 0$ into (i) slope-intercept form and (ii) intercept form

9. Find the equation of a line that cuts off equal intercepts on the co-ordinate axes and passing through the point (2, 3).

10. Find the line equation passing through the point (2, 2) and cutting off intercepts on the axes whose sum is 9.

11. Find the equation of the lines which cut-off intercepts on the axes whose sum and product are 1 and -6 respectively.

12. Find the equation of a line parallel to the line 3x - 4y + 2 = 0 and passing through the point (-2, 3).

13. Find the equation of a line perpendicular to the line 3x - 4y + 2 = 0 and passing through the point (-2, 3).

14. Find the equation of the line passing through (-3,5) and perpendicular to the line through the points (2,5) and (-3,6)

15. A line perpendicular to the line segment joining the pints (1, 0) and (2, 3) divides it in the ratio 1:n. Find the equation of the line.

16. Point R (h, K) divides a line segment between the axes in then ratio 1:2. Find equation of the line.

17. The perpendicular from the origin to a line meets it at the point (-2, 9). Find the equation of the line.

18. Find the equation of the right bisector of the line segment joining the points (3, 4) and (–1, 2).

19. The line through the points (h, 3) and (4, 1) intersects the line 7x-9y-19=0 at right angle. Find the value of h.

20. The perpendicular from the origin to the line y=mx + c meets it at the point (-1, 2). Find the values of m and c.

21. In the triangle ABC with vertices A (2, 3), B (4, –1) and C (1, 2), find the equation and length of altitude from the vertex A.

22. The vertices of triangle PQR are P (2, 1), Q (-2, 3) and R (4, 5). Find the equation of the median through vertex R.

23. Let P (a, b) is the mid-point of a line segment between axes. Show that the equation of the line is $\frac{x}{a} + \frac{y}{b} = 2$

24. Find the distance between the parallel lines (a) 3x – 4y +7 = 0 and 3x – 4y + 5 = 0 (b) $15x + 8y - 34 = 0$ and $15x + 8y + 31 = 0$

25. Find the distance of a point (-1, 1) from the line 12(x+6) = 5(y-2)

26. Find the points on X-axis, whose distances from the line $\frac{x}{3} + \frac{y}{4} = 1$ are 4 units.

27. Find the points on Y-axis, whose distances from the line $\frac{x}{3} + \frac{y}{4} = 1$ are 4 units.

28. If p and q are the lengths of perpendiculars from the origin to the lines $xcos\theta - ysin\theta = k\ and\ xsec\theta + ycosec\theta = k$, respectively, prove that $p^2 + 4q^2 = k^2$

29. If p is the length of perpendicular distance from origin to the line whose intercepts on the axes are a and b then show that $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

30. Find the coordinates of the foot of the perpendicular from the point (-1, 3) to the line 3x -4y- 16 =0.

31. Two lines passing through the point (2, 3) intersect each other at an angle of 60°. If the slope of one line is 2, find the equation of the other line.

32. If the lines 2x + y - 3=0, 5x + ky - 3=0, and 3x – y - 2=0 are concurrent then find the value of k.

33. Find the value of p, so that three lines 3x + y - 2=0, px + 2y -3=0 and 2x – y -3 =0 may intersect at one point.

34. Find the equation of the line passing through the point of intersection of the lines $4x + 7y - 3 = 0$ and $2x - 3y + 1 = 0$ that has equal intercepts on the axes.

35. Show that the area of a triangle formed by the lines $y=m_1x+c_1, y=m_2x+c_2$ and x=0 is $\frac{(c_1 - c_2)^2}{2(m_1 - m_2)}$

36. Find the area of the triangle formed by the lines y – x = 0, x + y = 0 and x – k =0.

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AUTUMN BREAK HOMEWORK (2023-24)

CLASS VIII MATHS

1. **Learn tables 1-25 & Write 10 times.**
2. **Learn the Squares of the numbers from 1-25.**
3. **Learn the Cubes of the numbers from 1-25.**
4. **Complete your Multi-Disciplinary Project.**