

New Era Progressive School

Korba

Dussehra Holiday Home Work

Class -XI

SUBJECT	SYLLABUS
ENGLISH	Read, Reflect and Recommend Q1 Read any short story, article, or book of your choice. Write a brief review in 100–120 words covering its main idea, what you liked, and whether you would recommend it to others. Mother's Day — A Message for Every Family Q.2 Design a small awareness poster titled Respect Begins at Home. Include three messages inspired by the play about sharing responsibilities and respecting family members. Birth — A Moment That Matters Q.3 Create a brief case study on Andrew Manson. Explain the problem he faced, what he decided to do, and the traits that led to his success. End with one key takeaway for young professionals. Guidelines for Arranging English Holiday Homework File: • Cover Page: School name, subject, student's name, class, section, roll number, and academic session. • Certificate: Confirmation of completion of the homework. • Acknowledgement: Thanking the teacher and others for their guidance. • Index: List of activities with page numbers. • Holiday Homework: All assigned activities completed in sequence. • Bibliography: List of books, websites, and other references used. Note: • Write neatly and legibly in your own handwriting. • Pay attention to spelling, grammar, and punctuation while completing your work. • Paste or draw relevant pictures wherever necessary to make your work interesting. • Avoid copying directly from the internet or other sources. Try to understand the topic and express your ideas independently. • Complete the homework on time and submit it on the first working day after the holidays.
ACCOUNTANCY	Practice from each cases of bank reconciliation statement 3 numerical questions for concept clarity.

ECONOMICS	learn all the 4 formulas of Correlation.
BUSINESS STUDIES	Prepare blue print of games and charts to be displayed on business expo using AI and the hardcopy work will begin from 23 rd oct 2026.
PHYSICAL EDUCATION	Task: Prepare Mind Map File for 7 Units List of 7 Units: 1. Unit 1: Changing Trends and Career in Physical Education 2. Unit 2: Olympism 3. Unit 3: Yoga 4. Unit 4: Physical Education and Sports for CWSN 5. Unit 5: Physical Fitness, Health and Wellness 6. Unit 6: Test, Measurement and Evaluation 7. Unit 7: Fundamentals of Anatomy and Physiology Instructions for Students: 1. Make this mind map in your own Physical Education fair copy notebook. 2. Make 1 mind map per unit — total 7 mind maps. 3. Use central theme, branches, keywords, small diagrams, colors. 4. Total 7 pages • Neatly hand-written • Focus on neatness and clarity Submission Date: 22nd October 2026 Total Marks: 20 _Note: Each mind map should include the unit as the central theme, with branches for keywords, diagrams, and key concepts.
HISTORY	Prepare a project file on any on the given topics. Topic - 1. Early Societies & Ancient Civilizations * Writing and City Life (Mesopotamia): Town planning, the development of cuneiform script, mathematics, astronomy, and the debate on the uses of writing. * Ancient History in Depth: Case studies on early urban centers, temple economies, and social structures in Mesopotamia. 2. Empires Across Continents & Nomadic Realms * The Roman Empire: Architecture (such as the Colosseum and aqueducts), government administration, social stratification, and the institution of slavery. * Greek Philosophy and City-States: Contributions of Athens and Sparta to politics, art, and philosophy. * Genghis Khan and the Nomadic Empires: The rise of the Mongol confederation, military organization, the Yasa legal code, and the Yam communication system.
POLITICAL SCIENCE	Imagine that you are a member of a committee reviewing the Indian Constitution. Propose one new constitutional amendment to address a contemporary issue. Possible themes: • Environmental protection. • Digital privacy and data protection. • Electoral reforms. • Gender equality. • Local self-government. • Access to education. • Transparency and accountability in public institutions. Prepare a report answering the following questions:

	1. What problem do you want to address? 2. Why are existing constitutional provisions or laws insufficient, in your view? 3. What change would you propose? 4. Which constitutional article or part might be affected? 5. How would your proposal benefit Indian citizens? 6. What challenges or risks might arise from your proposal? 7. Which constitutional amendment procedure is required to be adopted?
LEGAL STUDIES	Topic: Civil Court and Civil Justice System Theme: "Justice Beyond the Textbook" Task: Read the following fictional case and decide the dispute as if you were a civil court judge. Case: The Disputed Property Mr. Sharma owns a house. After his death, his two children, Amit and Neha, disagree over the ownership of the property. Amit claims that their father transferred the entire house to him through a valid gift deed. Neha argues that the document is invalid and that she is also entitled to a share in the property. Neha decides to approach a civil court. Your assignment: Answer the following questions: • Is this a civil dispute or a criminal dispute? Give reasons. • Which type of court may have jurisdiction to hear the case? • Who would be the plaintiff and who would be the defendant? • What is a plaint, and what details should it contain? • What evidence might the parties produce? • What remedies could the court grant, depending on the facts and applicable law? • If either party is dissatisfied with the judgment, what legal remedy might be available? • As a judge, what additional facts would you need before deciding the case?
BIOLOGY	Prepare an Investigatory Project file on any topic from the syllabus
CHEMISTRY	Complete the following practicals in your Chemistry Lab Manual in the given order. A. List of Practical 1. Preparation of 1/10 M Sodium Carbonate Solution. 2. Preparation of 1/10 M Oxalic Acid Solution. 3. To determine the strength of the given sodium hydroxide (NaOH) solution using M/20 oxalic acid solution. 4. To determine the strength and molarity of the given hydrochloric acid (HCl) solution using 0.05 M sodium carbonate (Na_2CO_3) solution. 5. To prepare crystals of pure copper sulphate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) from an impure sample of blue vitriol. 6. Classification of Anions. 7. Classification of Cations. 8. To analyse the given inorganic salt for acidic and basic radicals. 9. To analyse the given inorganic salt for acidic and basic radicals.

	10. To analyse the given inorganic salt for acidic and basic radicals. 11. To determine the pH of vegetable and fruit juices using pH paper and a universal indicator. B. Instructions for Writing the Lab Manual Write each practical using the following headings in the given order: 1. Aim 2. Materials Required 3. Theory 4. Observation Table 5. Conclusion 6. Result 7. Precautions (Write any two.) C. Important Instructions 1. Draw all diagrams and observation tables, and write all calculations and chemical reactions, on the unruled pages of the lab manual. 2. Write the remaining content neatly on the ruled pages. 3. Use a pencil for drawing diagrams and tables wherever appropriate. 4. Write all chemical equations correctly and balance them wherever required. 5. Maintain neatness, cleanliness, and proper presentation throughout the lab manual.
PHYSICS	1. Define pressure. Is it a scalar or a vector quantity? Explain why pressure acts normally to the surface in contact with a fluid at rest. [2 Marks] 2. Water flows through a horizontal pipe of varying cross-section. At a point where the cross-sectional area is 4 cm^2, the speed of water is 2 m/s and the pressure is $2 \times 10^5 \text{ N/m}^2$. Calculate the pressure at another point where the cross-sectional area is 2 cm^2. (Density of water = 1000 kg/m^3) [3 Marks] 3. A capillary tube of internal radius 0.25 mm is dipped obliquely into water of surface tension 0.072 N/m and density 1000 kg/m^3. If the angle of contact is 0°, calculate the height to which water rises in the capillary tube. (Take $g = 9.8 \text{ m/s}^2$) [3 Marks] 4. Distinguish between streamline flow and turbulent flow. Define critical velocity and write the expression for Reynolds number. [3 Marks] 5. State and prove Bernoulli's theorem for the streamline flow of an ideal fluid. Write the mathematical equation representing it. [4 Marks] 6. What is Torricelli's Law (Law of Efflux)? Derive an expression for the velocity of efflux of a liquid from a small hole at a depth h below the free surface. [3 Marks] 7. Define coefficient of viscosity and write its SI unit and dimensional formula. How does viscosity of liquids and gases vary with temperature? [2 Marks] 8. State Stokes' law for a spherical body moving through a viscous medium. Write the formula for terminal velocity and explain the terms involved. [3 Marks] 9. Define surface tension and surface energy. Establish the relation between surface tension (T) and surface energy per unit area ($W/\Delta A$). [3 Marks] 10. Explain excess pressure inside a liquid drop and a soap bubble. Derive the expression for excess pressure in both cases. [4 Marks]

ENTREPRENEURSHIP

Prepare a report/Story / poem,

Sub-Themes given - you can choose any one:

1. Meaning and Definition of Entrepreneurship
2. Need and Importance of Skill Development
3. New Opportunities in the Field of Artificial Intelligence (AI)
4. Vocational Education
5. Come, Let Us Become Skilled and self-reliant citizens
6. Inspiring Young Entrepreneurs: Motivational Success Stories
7. Online Marketing
8. Small and Cottage Industries: Self-Employment Opportunities
9. How to become a Successful Entrepreneur?
10. Skill Development for students
11. Let's Learn by Doing Business



Holiday Homework: Mathematics (Class XI)

4 Days | About 75 minutes per day | Total time $\approx$ 5 hours

Sets • Relations & Functions • Trigonometric Functions • Complex Numbers & Quadratic Equations • Linear Inequalities • Permutations & Combinations • Binomial Theorem • Sequences & Series • Straight Lines

Instructions:

- Do one day's work in one sitting, in a separate homework notebook. Write the day and date on top.
- Suggested timing per day: MCQs $\sim$ 12 min | Very Short $\sim$ 15 min | Short $\sim$ 25 min | Long $\sim$ 12 min | Case study $\sim$ 10 min.
- Show complete working for every question other than MCQs. Draw number lines and figures neatly with a pencil.
- Questions marked [Maths Around Us] connect mathematics with Korba, India, current events and our school.

DAY 1

Sets • Relations & Functions

Section A: MCQs and Assertion-Reason 1 mark each

- If $A = \{x : x \in \mathbb{N}, x^2 < 30\}$ and $B = \{x : x \text{ is a prime number, } x < 10\}$, then $n(A \cap B)$ is
(a) 2 (b) 3 (c) 4 (d) 5
- The number of proper subsets of the set of letters of the word **KORBA** is
(a) 32 (b) 31 (c) 30 (d) 25
- If $n(A) = 4$ and $n(B) = 3$, the number of relations from A to B which are *not* functions is
(a) 4096 (b) 81 (c) 4015 (d) 4014
- The domain of $f(x) = \frac{1}{\sqrt{|x|} - x}$ is
(a) $(-\infty, 0)$ (b) $(0, \infty)$
(c) $\mathbb{R} - \{0\}$ (d) $\mathbb{R}$
- The range of $f(x) = \frac{x^2}{1+x^2}$, $x \in \mathbb{R}$, is
(a) $[0, 1]$ (b) $[0, 1)$ (c) $(0, 1)$ (d) $[0, \infty)$
- Assertion (A):** If $A = \{1, 2\}$ and $B = \{3, 4\}$, then $A \times B$ has 16 subsets.
Reason (R): If $n(A) = p$ and $n(B) = q$, then $n(A \times B) = pq$.
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

Section B: Very Short Answer 2 marks each

- Write $A = \{x : x = 3n - 1, n \in \mathbb{N}, n \leq 5\}$ in roster form and find the number of its subsets.
- If $f(x) = x - \frac{1}{x}$, $x \neq 0$, prove that $f(x) + f\left(\frac{1}{x}\right) = 0$.
- $f = \{(1, 3), (2, 5), (3, 7), (4, 9)\}$ is a linear function $f(x) = ax + b$. Find a and b .

- Let $U = \{1, 2, \dots, 10\}$, $A = \{2, 4, 6, 8\}$ and $B = \{1, 2, 3, 4\}$. Verify that $(A \cup B)' = A' \cap B'$.

Section C: Short Answer 3 marks each

- [Maths Around Us]** In a survey of 200 students of New Era Progressive School, 120 like Mathematics, 90 like Physics, 70 like Chemistry, 40 like Mathematics and Physics, 30 like Physics and Chemistry, 35 like Mathematics and Chemistry, and 20 like all three. Find how many students like (i) none of the three, (ii) exactly one subject.
- Find the domain and range of $f(x) = \sqrt{9 - x^2}$.
- $R = \{(x, y) : x + 2y = 10; x, y \in \mathbb{N}\}$. Write R in roster form and find its domain and range.

Section D: Long Answer 5 marks

- Draw the graph of $f(x) = \begin{cases} 1 - x, & x < 0 \\ 1, & x = 0 \\ x + 1, & x > 0 \end{cases}$ and hence write its domain and range. Is f one value for each x ? Justify from the graph.

Section E: Case Study 4 marks

- [Maths Around Us]** Korba is known as the *Power Capital of Chhattisgarh*. Suppose a household in Korba pays a fixed charge of Rs. 100 per month, plus Rs. 6 per unit for the first 100 units and Rs. 7.50 per unit for every unit beyond 100.
(i) Express the monthly bill $B(u)$ for u units as a piecewise function.
(ii) Find the bill for 80 units and for 150 units.
(iii) If a bill is Rs. 1450, how many units were consumed?

DAY 2

Trigonometric Functions • Complex Numbers & Quadratic Equations

Section A: MCQs and Assertion-Reason 1 mark each

16. A wheel makes 360 revolutions per minute. The angle (in radians) it turns through in one second is
(a) 6π (b) 12π (c) 24π (d) 360π
17. The value of $\sin 75^\circ + \cos 75^\circ$ is
(a) $\frac{\sqrt{6}}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\sqrt{2}$ (d) 1
18. If $\tan \theta = \frac{3}{4}$ and $\pi < \theta < \frac{3\pi}{2}$, then $\cos \theta$ is
(a) $\frac{4}{5}$ (b) $-\frac{4}{5}$ (c) $\frac{3}{5}$ (d) $-\frac{3}{5}$
19. [Maths Around Us] In the year 2026, the value of i^{2026} is
(a) 1 (b) -1 (c) i (d) $-i$
20. The modulus of $\frac{(1+i)^4}{(1-i)^2}$ is
(a) 1 (b) 2 (c) 4 (d) $\sqrt{2}$
21. **Assertion (A):** The roots of $x^2 + x + 1 = 0$ are not real.
Reason (R): A quadratic equation with real coefficients has non-real roots when its discriminant is negative.
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

Section B: Very Short Answer 2 marks each

22. Prove that $\cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right) = \sqrt{2} \cos x$.
23. Find the value of $\sin(-1110^\circ)$.
24. Find the multiplicative inverse of $3 - 4i$.
25. Solve: $x^2 + 2x + 5 = 0$.

Section C: Short Answer 3 marks each

26. Prove that $\frac{\sin 2x + \sin 4x + \sin 6x}{\cos 2x + \cos 4x + \cos 6x} = \tan 4x$.
27. Find real numbers x and y if $(x + iy)(2 - 3i) = 4 + i$.
28. If $z = \frac{1+2i}{1-i}$, express z in the form $a + ib$ and find $|z|$ and $\bar{z}$.

Section D: Long Answer 5 marks

29. If $\cos x = -\frac{12}{13}$ and x lies in the third quadrant, find $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan 2x$.

Section E: Case Study

4 marks

30. [Maths Around Us] At the Dussehra mela in Korba, a giant wheel has radius 10 m and its centre is 12 m above the ground. A seat starts at the lowest point and the wheel turns anticlockwise.
(i) Find the length of the arc travelled by the seat when the wheel turns through 210° . (Use π .)
(ii) Find the height of the seat above the ground after it turns through 150° .
(iii) Through what angle (in radians) has the wheel turned when the seat is first 17 m above the ground?

Bonus: Maths Around Us

3 marks

31. India's Chandrayaan-3 landed near the Moon's south pole on 23 August 2023, a day now observed as National Space Day. The lander touched down near latitude 69° S. Taking the Moon's radius as 1737 km, find the distance along the Moon's surface from the equator to the landing site (along a meridian). Use $\pi = 3.14$.

DAY 3

Linear Inequalities • Permutations & Combinations • Binomial Theorem

Section A: MCQs and Assertion-Reason 1 mark each

32. The solution set of $-3 < 2x - 1 \leq 7$ is
(a) $(-1, 4)$ (b) $(-1, 4]$ (c) $[-1, 4]$ (d) $[-1, 4)$
33. The number of integers satisfying $|x - 3| < 5$ is
(a) 9 (b) 10 (c) 11 (d) 8
34. The number of arrangements of the letters of **KORBA** in which the two vowels are always together is
(a) 120 (b) 48 (c) 24 (d) 96
35. If ${}^nC_7 = {}^nC_5$, then ${}^nC_2$ equals
(a) 66 (b) 132 (c) 45 (d) 78
36. The middle term in the expansion of $\left(\frac{x}{2} + \frac{2}{x}\right)^8$ is
(a) 70 (b) 56 (c) 35 (d) 140
37. **Assertion (A):** $2^{3n} - 7n - 1$ is divisible by 49 for every $n \in \mathbb{N}$.
Reason (R): $8^n = (1 + 7)^n = 1 + 7n + 49k$ for some integer k .
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

Section B: Very Short Answer

2 marks each

38. Solve $\frac{2x+3}{4} - 3 < \frac{x-4}{3} - 2$ and show the solution on the number line.
39. How many 4-digit numbers greater than 5000 can be formed with the digits 0, 2, 5, 6, 8 if no digit is repeated?
40. Find n if ${}^nP_4 = 20 \cdot {}^nP_2$.
41. [Maths Around Us] The FIFA World Cup 2026 had 48 teams placed in 12 groups of 4. In the group stage, every team plays every other team of its group once. How many group-stage matches were played in all?

Section C: Short Answer

3 marks each

42. Solve the system and represent the solution on the number line:
 $2(x-1) < x+5$ and $3(x+2) > 2-x$.
43. [Maths Around Us] For our school's STREAM MO-SAIC exhibition, an organising committee of 5 is to be chosen from 7 boys and 5 girls. In how many ways can it be done if the committee must have at least 2 girls?
44. Find the term independent of x in $\left(x^2 - \frac{3}{x}\right)^9$. Also find the 5th term of $\left(2x - \frac{1}{x^2}\right)^7$.

Section D: Long Answer

5 marks

45. Consider the letters of the word **HOLIDAYS**. Treating O, I, A as the vowels, find the number of arrangements
 (i) in all;
 (ii) which begin with H and end with S;
 (iii) in which all the vowels are together;
 (iv) in which all the vowels are not together.

Section E: Case Study

4 marks

46. [Maths Around Us] Suppose the population of Korba city is 3,50,000 and it grows at 2% per year.
 (i) Write the population after n years.
 (ii) Using the first three terms of the binomial expansion, estimate the population after 3 years.
 (iii) Without a calculator, use the binomial theorem to decide which is larger: $(1.02)^{50}$ or 2.

DAY 4

Sequences & Series • Straight Lines

Section A: MCQs and Assertion-Reason

1 mark each

47. The 3rd and 7th terms of a G.P. of positive terms are 12 and 192. Its common ratio is
 (a) 2 (b) 4 (c) 3 (d) 16
48. The A.M. and G.M. of two positive numbers are 10 and 8. The numbers are
 (a) 12 and 8 (b) 16 and 4
 (c) 18 and 2 (d) 15 and 5

49. The slope of a line perpendicular to the line joining $(2, -3)$ and $(-4, 5)$ is
 (a) $-\frac{3}{5}$ (b) $\frac{3}{5}$ (c) $\frac{3}{4}$ (d) $-\frac{3}{4}$
50. The distance between the lines $3x + 4y = 7$ and $6x + 8y + 11 = 0$ is
 (a) $\frac{5}{2}$ (b) $\frac{18}{5}$ (c) $\frac{4}{5}$ (d) $\frac{9}{10}$
51. The line through $(2, 3)$ making equal intercepts on the axes is
 (a) $x + y = 5$ (b) $x - y = -1$
 (c) $x + y = 6$ (d) $2x + 3y = 13$
52. **Assertion (A):** The points $(1, 1)$, $(3, 5)$ and $(-1, -3)$ are collinear.
Reason (R): Three points A, B, C are collinear if slope of $AB = \text{slope of } BC$.
 (a) Both A and R are true, and R is the correct explanation of A.
 (b) Both A and R are true, but R is not the correct explanation of A.
 (c) A is true, but R is false.
 (d) A is false, but R is true.

Section B: Very Short Answer

2 marks each

53. Find the sum of the first 8 terms of the G.P. 3, 6, 12, ...
54. Insert three geometric means between 2 and 162.
55. Find the equation of the line through $(-2, 3)$ perpendicular to $3x - 4y + 5 = 0$.
56. Find the acute angle between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$.

Section C: Short Answer

3 marks each

57. The sum of the first three terms of a G.P. is $\frac{21}{4}$ and their product is 1. Find the common ratio and the terms.
58. Find the equations of the lines through $(3, -2)$ which make an angle of 45° with the line $x - 2y = 3$.
59. Find the image of the point $(1, 2)$ in the line $x - y + 3 = 0$.

Section D: Long Answer

5 marks

60. Find the sum to n terms of $4 + 44 + 444 + \dots$. Hence verify your formula for $n = 5$ by direct addition.

Section E: Case Study

4 marks

61. [Maths Around Us] A drone map of the NEPS campus uses the school gate as origin $O(0, 0)$ (1 unit = 10 m). The library is at $B(6, 8)$ and the canteen at $C(12, 0)$. A straight paved path joins the library and the canteen.
 (i) Find the distance (in metres) from the gate to the library.
 (ii) Find the equation of the path BC .
 (iii) A student at the gate wants to reach the path BC by the shortest route. Find this shortest distance in metres.

Happy holidays! Revise formulas daily.

3 of 3

PSYCHOLOGY

- Prepare a project file on any on the given topics.

Topic: How Can Students Manage Exam Stress and Complete Their Syllabus on Time?
 The Situation

Riya is a Class 11 student. Her examinations are approaching, but she has not completed her syllabus. She spends a lot of time on social media, feels confused about which subject to study first, and becomes anxious when she sees how much work is left.

She tries to study for long hours but often forgets what she has learned. She believes that she cannot improve because she has always been an average student. She needs to find a practical solution to manage her time, improve her learning, and prepare confidently for her examinations.

Your Task

Imagine that you are Riya's friend. Help her solve this problem using the concepts from the chapter Thinking.

1. Problem-Solving (Identify Riya's main problem and suggest three possible solutions.)
2. Obstacles to Problem-Solving (Is Riya facing a mental set, lack of motivation, or another obstacle? Explain your answer.)
3. Decision-Making (Riya has three options: study every subject equally, focus only on difficult subjects, or prepare a daily timetable. Which option should she choose, and why?)

	4. Creative Thinking (Suggest two creative ways Riya can make studying more interesting and effective.) 5. Thinking and Language (How can positive self-talk, such as “I can improve with regular practice,” help Riya?) 6. Problem-Solving Strategy (Prepare a simple five-day study plan for Riya, including study time, breaks, revision and sleep.) Final Question If you were Riya, what would you do differently to solve this problem? Explain your answer using at least three concepts from the chapter. Project outcome: Your solution should be practical, realistic																								
COMPUTER SCIENCE	1) Convert the following as directed with complete steps. a) Convert the Binary number 101011 to its Decimal equivalent. b) Convert the Decimal number 125 into its Binary equivalent. c) Convert the Hexadecimal number AB to its Decimal equivalent. 2) Write a Python program to calculate the average of the numbers of the tuple? 3) Write a Python program to create a dictionary named year whose keys are month names and values are their corresponding number of days. 4) Write a program to input ‘n’ employee number and name and to display all employee’s information in ascending order based upon their number. Note: Write the answers in your Practical notebook.																								
KATHAK	Write a short note on Kathak Dance in your notebook. Note: Prepare the notes in your own words after understanding the topic. Do not copy directly from books or other sources. Thank you.																								
APPLIED MATHS	<i>Topics: Limits, Continuity and Differentiation</i> Name: _____ Class/Section: _____ Roll No.: _____ Submission Date: _____ ACTIVITY 1: EXPLORING LIMITS THROUGH GRAPHS Objective: To understand the concept of limits through graphical representation. Materials Required: Graph paper, pencil, ruler and eraser. Procedure: 1. Draw the graphs of $y = x$, $y = x^2$ and $y = x$ on graph paper. 2. Observe each graph near $x = 0$. 3. Prepare a table of values for $x = -0.1, -0.01, 0, 0.01$ and 0.1. 4. Calculate the corresponding function values for each function. 5. Write your observations about how the function values behave as x approaches 0. Observation Table: <table><tr><th>x</th><th>$y = x$</th><th>$y = x^2$</th><th>$y = x$</th></tr><tr><td>-0.1</td><td></td><td></td><td></td></tr><tr><td>-0.01</td><td></td><td></td><td></td></tr><tr><td>0</td><td></td><td></td><td></td></tr><tr><td>0.01</td><td></td><td></td><td></td></tr><tr><td>0.1</td><td></td><td></td><td></td></tr></table> Conclusion: Explain in your own words what a limit tells us about the behaviour of a function near a particular value.	x	$y = x$	$y = x^2$	$y = x $	-0.1				-0.01				0				0.01				0.1			
x	$y = x$	$y = x^2$	$y = x $																						
-0.1																									
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ACTIVITY 2: CONTINUITY IN REAL LIFE

Objective: To identify examples of continuous and discontinuous changes in everyday life.

Materials Required: A4 sheets/project file, pencil/coloured pens, and photographs or drawings.

Procedure:

6. Identify three examples of gradual (continuous-like) changes and three examples of sudden or stepwise changes from everyday life.
7. Add a photograph, drawing or labelled diagram for each example.
8. Complete the table below and explain each example in 2–3 sentences.
9. Write how the mathematical idea of continuity can help us describe changes.

Type of change	Example from daily life	Explanation / drawing reference
Gradual change 1		
Gradual change 2		
Gradual change 3		
Sudden/stepwise change 1		
Sudden/stepwise change 2		
Sudden/stepwise change 3		

Conclusion: Explain why some real-life changes can be modelled as continuous, while others may be represented as sudden or stepwise changes.

Note: These are conceptual illustrations. A real-life example is not automatically a mathematically continuous or discontinuous function unless it is modelled precisely.

ACTIVITY 3: DIFFERENTIATION IN DAILY LIFE — BUSINESS COST

Objective: To understand how differentiation represents the rate of change of a quantity.

Situation: An imaginary company's total cost of producing x units is given by:

$$C(x) = x^2 + 10x + 50$$

Here, x is the number of units produced and $C(x)$ is the total cost in hypothetical cost units.

Materials Required: Notebook/A4 sheet, pencil, ruler and calculator (optional).

Tasks:

10. Calculate the total cost $C(x)$ for $x = 2, 4$ and 6 .
11. Differentiate the cost function to obtain the marginal cost function: $MC = dC/dx$.
12. Find the marginal cost at $x = 2, 4$ and 6 .
13. Draw a graph of total cost $C(x)$ against the number of units x for $x = 0$ to 6 .
14. Explain in your own words how differentiation helps a business understand the rate at which cost changes.

Number of units (x)	Total cost $C(x)$	Marginal cost $MC(x)$
2		
4		
6		

Conclusion: _____

GENERAL INSTRUCTIONS

- Complete all three activities on A4 sheets or in a project file.
- For each activity, include Aim, Materials Required, Procedure, Observations and Conclusion.
- Use neat graphs, tables and labelled diagrams wherever required.
- Show all calculations and write conclusions in your own words.
- Keep the work neat, creative and self-explanatory.

SUGGESTED ASSESSMENT (10 MARKS PER ACTIVITY)

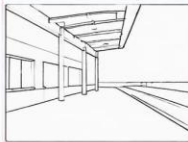
Assessment criterion	Marks
Conceptual understanding	3
Presentation and creativity	2
Calculations / observations	3
Conclusion	2

PAINTING

Railway Station Drawing – Step by Step Method

Step 1

Draw the station building, platform and roof.



Step 2

Draw the train and railway tracks.



Step 3

Add passengers, benches and luggage.



Step 4

Add more details like signboard, clock and trees.



Step 5

Colour the drawing neatly using watercolours or poster colours.



Final Colour Drawing



Instructions:

1. Draw the station building, platform and roof.
2. Add a train and railway tracks.
3. Include passengers, benches, luggage and other station details.
4. Show proper perspective, proportion and background.
5. Use watercolours or poster colours to complete the drawing neatly.

You can also include:

- Ticket counter
- Food stall
- Name board
- Foot overbridge
- Trees and sky in the background
- Your own creative ideas

Practical Activity: Railway Station Composition

Create a colourful composition on the theme “A Busy Railway Station” on an A3 drawing sheet.

Students may refer to the given sample or create their own original railway station composition using their imagination and creativity.

Instructions:

- Include a train, railway platform, passengers and other station details.
- Show proper perspective, proportion and foreground, middle ground and background.
- Use watercolours or poster colours.
- Complete the artwork neatly and submit it after the holidays.

Note: Students are encouraged to use their own creative ideas. The composition need not be exactly the same as the sample

Last date of submission of Holiday Homework is 26/10/2026