

Holiday Homework – Class IX

SESSION 2026–27

LSubject: Social Science (SST)

Activity 1: History – Timeline of Ancient India

Prepare a timeline showing any 8 important events in ancient Indian history, from the beginning of early human life to the Gupta period.

- Mention the year or approximate period of each event.
- Write one line about the importance of each event.

Activity 2: Geography – Natural Resources

Prepare a table of 10 natural resources found in India.

Include the following columns:

1. Name of the resource
2. Type of resource (renewable or non-renewable)
3. Major producing state
4. One method of conservation

Activity 3: Political Science – Democracy in Daily Life

Identify five situations in which democratic principles are practised in daily life.

For each situation, write:

- The situation
- The democratic principle involved
- How it promotes equality or participation

Activity 4: Economics – Household Budget

Prepare a monthly household budget using an assumed family income of ₹30,000.

Include:

- Food
- Education
- Housing
- Transport
- Healthcare
- Savings
- Other expenses

Calculate the total expenditure and the amount saved.

Activity 5: Map Activity – India

On an outline map of India, locate and label:

- Five major rivers
- Five major dams
- Five major mineral-producing states
- Five major agricultural-producing states

MATHEMATICS HOLIDAY HOMEWORK

GENERAL INSTRUCTIONS:

- Geometric constructions must be executed accurately using a sharp pencil, protractor, and ruler.
- Show complete mathematical steps, reasonings, and units clearly for all numerical questions.
- Originality and presentation carry separate weightage in the final internal assessment (10 Marks Portfolio).

TASK 1: THE NAUTILUS ARCHITECT (Square Root Spiral)

Architectural Context & Hands-on Activity:

You are commissioned to design a spiraling shell-shaped decorative stone pathway for a botanical garden.

- On an A4 cartridge sheet, construct the foundation as an isosceles right triangle with perpendicular stone borders of length 1 unit (1 cm or 2 cm scaled) each, giving hypotenuse H_1 .
- At the tip of H_1 , construct a line segment of length 1 unit perpendicular to H_1 to produce H_2 .
- Continue this iterative process smoothly up to H_7 . Color the spiraling sectors decoratively.

Analytical Questions:

Question 1.1 (The Stone Mason's Whole Numbers):

Question 1(The Rational Gatekeeper):

The architect decides to place ornamental brass markers along the spiral pathway only at points where the hypotenuse length is a rational number.

- (a) If the spiral is extended from triangle $n = 1$ to triangle $n = 25$, list all values of n where a brass marker must be installed.
- (b) Between H_1 and H_{25} , how many total paths are irrational numbers? Justify mathematically with reference to non-perfect squares.

TASK 2: THE FAMILY BUDGET POLYNOMIAL (Polynomials in Daily Life)

The Premise:

Imagine stepping into the role of Chief Financial Officer (CFO) of your household during the vacation.

Your objective is to translate your kitchen's grocery consumption into an algebraic model and analyze household expenditure trends.

Analytical Questions:

Question 2.1 (The Kitchen Equation):

Your household pantry runs on three primary grocery essentials: whole wheat flour sacks (x), milk crates (y), and seasonal fruit boxes (z). Their unit prices are fixed at ₹50, ₹30, and ₹100 respectively.

According to historical household usage, the demand follows the rules: $y = 3x$ and $z = x - 2$.

- (a) Construct the total expenditure polynomial $E(x)$ as a single-variable polynomial in standard form.
- (b) State the degree, the leading coefficient, and the constant term of $E(x)$.

Question 2.2 (Audit the Vacation Bill):

During a festival week, the household kitchen consumes exactly $x = 6$ flour sacks.

- (a) Evaluate $E(6)$ to determine the exact expenditure incurred.
- (b) If the allocated weekly grocery budget was ₹1,500, calculate whether the pantry operated at a surplus or deficit, and find the exact variance.

TASK 3: MAP YOUR ROOM (Cartesian Exploration & Coordinate Geometry)

The Premise:

Transform your study room floor into a Cartesian Coordinate Plane.

- Designate the southwest corner of your room where two perpendicular walls meet as the Origin (0, 0).
- The wall running East forms the positive x-axis; the wall running North forms the positive y-axis.
- Take a scale of 1 floor tile = 1 unit (or 50 cm = 1 unit).

Analytical Questions:

Question 3.1 (The Lost Items Triangle):

While rearranging your study, three items are located on the floor grid at the following coordinates:

- Bookmark at A(2, 5)
- Water Bottle at B(8, 5)
- Backpack at C(2, 1)

- (a) Plot these coordinates on a neatly ruled Cartesian grid.
- (b) Classify the type of triangle formed by $\triangle ABC$.
- (c) Calculate the lengths of segments AB and AC directly by coordinate subtraction, and compute the total perimeter and area of $\triangle ABC$.

Question 3.2 (The Mirror Reflection Challenge):

A night-light emits light from coordinates L(4, -3) on an extended architectural blueprint grid.

- (a) Determine the coordinates of L' when L is reflected across the x-axis.
- (b) Determine the coordinates of L'' when L' is subsequently reflected across the y-axis.
- (c) Identify the quadrants in which points L, L', and L'' lie.

TASK 4: THE GEOMETRY DETECTIVE (Lines & Angles in Structural Design)

The Premise:

An architectural inspector is checking whether structural support grill bars in a modern window installation conform to safety tolerances.

Two parallel steel members AB and CD are intersected by a diagonal reinforcement strut EF.

Analytical Questions:

Question 4.1 (The Transversal Sensor Check):

The sensor measures two alternate interior angles formed by the diagonal strut as:

$$\angle 1 = (5x - 28)^\circ \text{ and } \angle 2 = (3x + 16)^\circ.$$

- (a) Using the Alternate Interior Angle Axiom for parallel lines ($AB \parallel CD$), establish the linear equation and solve for the unknown parameter x .
- (b) Determine the exact numerical measure of $\angle 1$ and $\angle 2$.
- (c) Find the measure of the consecutive interior angle on the same side of the transversal as $\angle 1$.

Question 4.2 (Geometric Feasibility & Properties):

- (a) Calculate the supplement of the angle $\angle 1$ obtained in Question 4.1.
- (b) Does a geometric complement exist for $\angle 1$? Justify your reasoning based on the fundamental

English

1. **Prepare a PowerPoint presentation (PPT) on your favourite chapter from your textbook.**
2. **Create a brochure highlighting any one unique aspect of India's food culture, traditions, or wonders.**

ARTS EDUCATION – CLASS 9- HOMEWORK

1: Primary and Secondary Colours

Draw 2 big circles. In the first, fill Primary Colours – Red, Yellow, Blue. In the second, fill Secondary Colours – Orange, Green, Purple. Write how secondary colours are made.

- *2: My School*

Draw your school building. Include the national flag, playground, and 2 trees.

3: Warli Art

Draw Warli tribal art showing 5 people working in a farm. Use only black pen on white paper.

4: Leaf Printing

Take 3 different leaves, apply colour on them and print on paper. Make a tree using those prints.

5: Festival Scene

Draw a festival scene – Diwali or Eid. Show lamps / moon, houses and people celebrating.

AUTUMN BREAK HOMEWORK / PRACTICE ASSESSMENT

CLASS IX – ARTIFICIAL INTELLIGENCE (SUBJECT CODE 417)

SECTION A: EMPLOYABILITY SKILLS

Q1. Which of the following is an example of non-verbal communication commonly observed during an oral presentation?

- (a) Writing bullet points on a slide
- (b) Maintaining steady eye contact with the audience
- (c) Delivering a spoken introductory speech
- (d) Sending a digital summary via email

Q2. [Competency Based] Suman drafted an urgent project email to her team member. However, because she used all capital letters and omitted polite greetings, her colleague felt offended and felt Suman was shouting. Which barrier or factor affected effective communication here?

- (a) Language / Translation barrier
- (b) Absence of tone and non-verbal cues in written text
- (c) Physical environmental noise
- (d) Technical network failure

Q3. The internal ability to regulate one's emotions, control impulses, monitor performance, and stay focused on targets without constant external supervision is known as:

- (a) Self-Awareness
- (b) Self-Management
- (c) Self-Motivation
- (d) Social Awareness

Q4. [Competency Based] Rohan has his AI final exams next week. Instead of cramming at the last minute, he creates a detailed daily study timetable, prioritizes weak chapters, and sets specific hourly goals. Which self-management domain is Rohan applying?

- (a) Stress Management
- (b) Time Management & Goal Setting
- (c) Self-Defense Skill
- (d) Emotional Intelligence

Q5. Which keyboard shortcut in Windows OS allows a user to permanently delete a selected file or folder without sending it to the Recycle Bin?

- (a) Ctrl + Delete
- (b) Shift + Delete
- (c) Alt + Delete
- (d) Fn + Delete

Q6. [Competency Based] Ananya is creating a presentation for her KVS Science Exhibition. She needs to create, rename, and organize subfolders on her computer drive to separate raw photos from edited charts. Which utility software is designed for this task?

- (a) File Explorer
- (b) Web Browser
- (c) Control Panel
- (d) Task Manager

Q7. An entrepreneur is best defined as a person who:

- (a) Works in a government office with fixed daily hours
- (b) Identifies a market need, takes calculated risks, and sets up an innovative business enterprise
- (c) Performs voluntary social service without financial planning
- (d) Buys goods only for personal consumption

Correct Answer: (b) Identifies a market need, takes calculated risks, and sets up an innovative business enterprise

Q8. [Competency Based] In a small hilly village, farmers faced huge losses because their fresh fruits spoiled before reaching urban wholesale markets. Sunita developed a mobile-based app connecting village farmers directly to local fruit processing units. Sunita is demonstrating:

- (a) Traditional employment behavior
- (b) Entrepreneurial problem-solving and value creation
- (c) Routine administrative work
- (d) Civil service duty

Correct Answer: (b) Entrepreneurial problem-solving and value creation

Q9. Which of the following activities directly supports sustainable development and green skills?

- (a) Leaving computer systems on standby mode overnight
- (b) Adopting the 4 Rs (Refuse, Reduce, Reuse, Recycle) in daily operations

- (c) Increasing the use of single-use plastic packaging
- (d) Wasting paper by printing unnecessary documents

Q10. [Competency Based] A Kendriya Vidyalaya school campus installed smart solar-powered sensors that automatically turn off classroom fans and lights when no movement is detected for 10 minutes. This technology adoption reflects:

- (a) Unchecked technological expansion
- (b) Green skills and energy conservation strategy
- (c) E-waste promotion
- (d) High energy depletion

SECTION B: SUBJECT SPECIFIC SKILLS (ARTIFICIAL INTELLIGENCE)

Q11. In the AI Project Cycle, which stage involves setting the goal, identifying stakeholders, and defining problem boundaries using the 4Ws Canvas?

- (a) Data Acquisition
- (b) Problem Scoping
- (c) Data Exploration
- (d) Model Evaluation

Q12. Which 'W' in the 4Ws Problem Scoping Canvas is used to record details about the environment, context, or location where the problem occurs?

- (a) Who
- (b) What
- (c) Where
- (d) Why

Q13. Which domain of Artificial Intelligence enables machines to capture, process, and analyze visual information from digital images or live video feeds?

- (a) Natural Language Processing (NLP)
- (b) Computer Vision (CV)
- (c) Statistical Data Science
- (d) Neural Robotics

Q14. [Competency Based] An AI system built to evaluate job resumes rejected most female applicants because it was trained entirely on historical company data from 2010 where 90% of hires were male. This situation is a classic example of:

- (a) Data Privacy breach
- (b) AI Bias / Algorithmic Bias
- (c) Hardware failure
- (d) System Overfitting

Q15. [Competency Based] A Healthcare diagnostic mobile application allows patients to type or speak their symptoms in simple natural English, after which it extracts keywords to suggest potential medical advice. Which AI domain drives this functionality?

- (a) Computer Vision
- (b) Natural Language Processing (NLP)
- (c) Autonomous Robotics
- (d) Virtual Reality

Q16. Which of the following represents a correct sequential order of stages in the standard AI Project Cycle?

- (a) Problem Scoping -> Data Acquisition -> Data Exploration -> Modelling -> Evaluation
- (b) Data Acquisition -> Problem Scoping -> Modelling -> Evaluation -> Data Exploration
- (c) Modelling -> Data Exploration -> Problem Scoping -> Evaluation -> Data Acquisition
- (d) Evaluation -> Problem Scoping -> Data Acquisition -> Modelling -> Data Exploration

Q17. Smart Voice Assistants like Google Assistant, Apple Siri, and Amazon Alexa convert user speech into text, understand intent, and generate voice responses. They operate primarily on:

- (a) Computer Vision only
- (b) Natural Language Processing (NLP)

- (c) Mechanical Automation
- (d) Pixel Processing

Q18. [Competency Based] A smart security team wants to deploy a biometric attendance system in a school gate. Before training the AI software, they spend two weeks collecting 5,000 photos of students under different lighting conditions. Which AI Project Cycle stage is being performed?

- (a) Problem Scoping
- (b) Data Acquisition
- (c) Model Testing
- (d) Deployment

Q19. The concept of 'AI Ethics' deals with which of the following issues in modern technology?

- (a) Ensuring AI systems operate safely, transparently, without bias, and respect privacy
- (b) Increasing the execution clock speed of AI graphics hardware
- (c) Enforcing high subscription fees for software usage
- (d) Standardizing Python code syntax across schools

Q20. [Competency Based] A smart traffic control camera installed at a busy intersection in New Delhi scans vehicle numbers, identifies helmetless riders, and automatically sends traffic violation tickets. Which AI domain is integrated into this camera?

- (a) Natural Language Processing
- (b) Computer Vision
- (c) Speech Synthesis
- (d) Text Summarization

Class IX – Science | Chapters: Cell and Tissue

Name: _____

Roll No.: _____

Instructions: Attempt all questions. Write answers neatly in your notebook. Draw well-labelled diagrams wherever required.

Section A: Multiple-Choice Questions (1 mark each)

1. Which part of the cell controls most of its activities?
(a) Cytoplasm (b) Nucleus (c) Cell membrane (d) Vacuole
2. The selectively permeable boundary of a cell is the:
(a) Cell wall (b) Plasma membrane (c) Nuclear membrane (d) Cytoplasm
3. Which cell organelle is known as the “powerhouse of the cell”?
(a) Ribosome (b) Golgi apparatus (c) Mitochondrion (d) Lysosome
4. Which structure is present in plant cells but generally absent in animal cells?
(a) Cell membrane (b) Cytoplasm (c) Cell wall (d) Nucleus
5. The tissue responsible for the growth of a plant is:
(a) Permanent tissue (b) Meristematic tissue (c) Xylem (d) Phloem
6. Which plant tissue transports water and minerals from roots to other parts?
(a) Phloem (b) Xylem (c) Epidermis (d) Parenchyma
7. Which of the following is a connective tissue in animals?
(a) Nervous tissue (b) Muscle tissue (c) Blood (d) Epithelial tissue
8. The basic structural and functional unit of life is the:
(a) Tissue (b) Organ (c) Cell (d) Organ system

Section B: Very Short Answer Questions (2 marks each)

9. State any two differences between plant cells and animal cells.
10. What is the function of the plasma membrane? Why is it called selectively permeable?
11. Write two functions of the nucleus.

12. Differentiate between rough endoplasmic reticulum and smooth endoplasmic reticulum.
13. What are meristematic tissues? Name any two types based on their location.
14. Give two differences between xylem and phloem.
15. What is the role of epithelial tissue in animals? Mention one place where it is found.
16. Differentiate between striated and smooth muscles on the basis of appearance and control.

Section C: Short Answer Questions (3 marks each)

17. Explain the functions of any three cell organelles.
18. What are permanent tissues? Briefly explain the difference between simple and complex permanent tissues.
19. Describe the structure and function of nervous tissue.

Section D: Case-Based Questions

20. Read the passage and answer the questions that follow.

A student observes two cells under a microscope. Cell A has a rigid outer covering, a large central vacuole and green plastids. Cell B has no rigid outer covering and has small vacuoles. Both cells have a cell membrane, cytoplasm and a nucleus.

- (a) Identify Cell A and Cell B. (1 mark)
- (b) Name the rigid outer covering of Cell A. (1 mark)
- (c) State one function of the large central vacuole. (1 mark)

21. Read the passage and answer the questions that follow.

A plant transports water and dissolved minerals from its roots to the leaves. It also carries prepared food from the leaves to growing and storage parts. These functions are performed by two different vascular tissues.

- (a) Name the tissue that transports water and minerals. (1 mark)
- (b) Name the tissue that transports prepared food. (1 mark)
- (c) Why are these tissues called complex tissues? (1 mark)

22. Read the passage and answer the questions that follow.

When a person touches a hot object, messages travel rapidly through specialised cells to the central nervous system, which helps the body respond. The body also contains tissues that cover surfaces and protect organs, as well as tissues that contract to produce movement.

- (a) Name the tissue that carries messages. (1 mark)
- (b) Name the tissue that covers and protects body surfaces. (1 mark)
- (c) Which type of tissue contracts to produce movement? (1 mark)

Section E: Diagram-Based Question

23. Draw a neat, well-labelled diagram of a plant cell and label any five parts.

Section F: Application-Based Questions

24. A student places raisins in plain water and observes that they swell. Explain this observation using the concept of movement of water across a selectively permeable membrane.
25. Why do plants need different specialised tissues for transport, support and growth? Explain briefly with one example of each.

MATHEMATICS HOLIDAY HOMEWORK

CLASS IX • SESSION 2026–27

Student's Name: _____

Roll No.: _____

GENERAL INSTRUCTIONS:

Geometric constructions must be executed accurately using a sharp pencil, protractor, and ruler.

Show complete mathematical steps, reasonings, and units clearly for all numerical questions.

Originality and presentation carry separate weightage in the final internal assessment (10 Marks Portfolio).

TASK 1: THE NAUTILUS ARCHITECT (Square Root Spiral)

Architectural Context & Hands-on Activity:

You are commissioned to design a spiraling shell-shaped decorative stone pathway for a botanical garden.

- On an A4 cartridge sheet, construct the foundation as an isosceles right triangle with perpendicular stone borders of length 1 unit (1 cm or 2 cm scaled) each, giving hypotenuse H_1 .
- At the tip of H_1 , construct a line segment of length 1 unit perpendicular to H_1 to produce H_2 .
- Continue this iterative process smoothly up to H_7 . Color the spiraling sectors decoratively.

Analytical Questions:

Question 1.1 (The Stone Mason's Whole Numbers):

Question 1 (The Rational Gatekeeper):

The architect decides to place ornamental brass markers along the spiral pathway only at points where the hypotenuse length is a rational number.

(a) If the spiral is extended from triangle $n = 1$ to triangle $n = 25$, list all values of n where a brass marker must be installed.

(b) Between H_1 and H_{25} , how many total paths are irrational numbers? Justify mathematically with reference to non-perfect squares.

TASK 2: THE FAMILY BUDGET POLYNOMIAL (Polynomials in Daily Life)

The Premise:

Imagine stepping into the role of Chief Financial Officer (CFO) of your household during the vacation.

Your objective is to translate your kitchen's grocery consumption into an algebraic model and analyze household expenditure trends.

Analytical Questions:

Question 2.1 (The Kitchen Equation):

Your household pantry runs on three primary grocery essentials: whole wheat flour sacks (x), milk crates (y), and seasonal fruit boxes (z). Their unit prices are fixed at ₹50, ₹30, and ₹100 respectively. According to historical household usage, the demand follows the rules: $y = 3x$ and $z = x - 2$.

- (a) Construct the total expenditure polynomial $E(x)$ as a single-variable polynomial in standard form.
- (b) State the degree, the leading coefficient, and the constant term of $E(x)$.

Question 2.2 (Audit the Vacation Bill):

During a festival week, the household kitchen consumes exactly $x = 6$ flour sacks.

- (a) Evaluate $E(6)$ to determine the exact expenditure incurred.
- (b) If the allocated weekly grocery budget was ₹1,500, calculate whether the pantry operated at a surplus or deficit, and find the exact variance.

TASK 3: MAP YOUR ROOM (Cartesian Exploration & Coordinate Geometry)

The Premise:

Transform your study room floor into a Cartesian Coordinate Plane.

- Designate the southwest corner of your room where two perpendicular walls meet as the Origin $(0, 0)$.
- The wall running East forms the positive x -axis; the wall running North forms the positive y -axis.
- Take a scale of 1 floor tile = 1 unit (or 50 cm = 1 unit).

Analytical Questions:

Question 3.1 (The Lost Items Triangle):

While rearranging your study, three items are located on the floor grid at the following coordinates:

- Bookmark at $A(2, 5)$
- Water Bottle at $B(8, 5)$
- Backpack at $C(2, 1)$

- (a) Plot these coordinates on a neatly ruled Cartesian grid.
- (b) Classify the type of triangle formed by $\triangle ABC$.
- (c) Calculate the lengths of segments AB and AC directly by coordinate subtraction, and compute the total perimeter and area of $\triangle ABC$.

Question 3.2 (The Mirror Reflection Challenge):

A night-light emits light from coordinates $L(4, -3)$ on an extended architectural blueprint grid.

- (a) Determine the coordinates of L' when L is reflected across the x -axis.
- (b) Determine the coordinates of L'' when L' is subsequently reflected across the y -axis.
- (c) Identify the quadrants in which points L , L' , and L'' lie.

TASK 4: THE GEOMETRY DETECTIVE (Lines & Angles in Structural Design)

The Premise:

An architectural inspector is checking whether structural support grill bars in a modern window installation conform to safety tolerances.

Two parallel steel members AB and CD are intersected by a diagonal reinforcement strut EF .

Analytical Questions:

Question 4.1 (The Transversal Sensor Check):

The sensor measures two alternate interior angles formed by the diagonal strut as:

$\angle 1 = (5x - 28)^\circ$ and $\angle 2 = (3x + 16)^\circ$.

- (a) Using the Alternate Interior Angle Axiom for parallel lines ($AB \parallel CD$), establish the linear equation and solve for the unknown parameter x .
- (b) Determine the exact numerical measure of $\angle 1$ and $\angle 2$.
- (c) Find the measure of the consecutive interior angle on the same side of the transversal as $\angle 1$.

Question 4.2 (Geometric Feasibility & Properties):

- (a) Calculate the supplement of the angle $\angle 1$ obtained in Question 4.1.
- (b) Does a geometric complement exist for $\angle 1$? Justify your reasoning based on the fundamental