

PM SHRI KENDRIYA VIDYALAYA NO.1 ROORKEE

AUTUMN BREAK HOLIDAY HOMEWORK

Mathematics | Class 11

Session 2026-27

Autumn Break: 15 October 2026 to 24 October 2026 (10 days)

Instructions for Students

1. Attempt one worksheet each day. Do all the work neatly in your Maths notebook.
2. Write the question number and then the complete solution, showing each step.
3. Draw diagrams and graphs with a pencil and ruler wherever needed.
4. Revise the chapter from the textbook before starting that day's worksheet.
5. This is revision work only, based on what has already been taught in class.

Day 1: Sets

1. Write the set of vowels in the English alphabet in roster form.
2. If $A = \{1, 2, 3, 4\}$ and $B = \{3, 4, 5, 6\}$, find $A \cup B$ and $A \cap B$.
3. Write in set-builder form: $\{2, 4, 6, 8\}$.
4. If $n(A) = 20$, $n(B) = 15$ and $n(A \cap B) = 5$, find $n(A \cup B)$.
5. Write the power set of $\{a, b\}$.
6. If $A = \{x : x \text{ is a prime number less than } 10\}$, write A in roster form.
7. For $A = \{1, 2, 3\}$ and $B = \{3, 4\}$, find $A - B$ and $B - A$.
8. In a class of 40 students, 25 play football and 20 play cricket, and 10 play both. How many play neither?

Day 2: Relations and Functions

1. If $A = \{1, 2\}$ and $B = \{3, 4\}$, find $A \times B$.
2. Define a function and give one example.
3. Find the domain of $f(x) = 1/(x - 2)$.
4. If $f(x) = 2x + 3$, find $f(2)$ and $f(0)$.
5. Find the range of $f(x) = x^2$.
6. If $f(x) = x^2$ and $g(x) = x + 1$, find $(f + g)(x)$.
7. Find the domain of $f(x) = \sqrt{x - 3}$.
8. For $R = \{(1, 2), (2, 3), (3, 4)\}$, write the domain and the range.

Day 3: Trigonometric Functions

1. Convert 60 degrees into radians.
2. Convert $\pi/4$ radians into degrees.
3. Find the value of $\sin 150$ degrees.
4. Find the value of $\cos(-60$ degrees).
5. Prove that $\sin(\pi + x) = -\sin x$.
6. If $\sin x = 1/2$, find the general solution for x .
7. Find the value of $\tan(3\pi/4)$.
8. Find the maximum and the minimum value of $3 + 2 \sin x$.

Day 4: Complex Numbers

1. Express $(3 + 2i) + (1 - 5i)$ in the form $a + bi$.
2. Find the modulus of $3 + 4i$.
3. Find the conjugate of $2 - 3i$.
4. Multiply: $(2 + i)(3 - 2i)$.
5. Find the value of i^{15} .
6. Express $1/(1 + i)$ in the form $a + bi$.
7. Find the multiplicative inverse of i .
8. Solve: $x^2 + 4 = 0$.

Day 5: Linear Inequalities

1. Solve: $3x - 5 < 7$.
2. Solve $5x + 3 \leq 18$ and represent the solution on a number line.
3. Solve: $-3 < 2x + 1 \leq 5$.
4. Solve: $2(2x + 3) - 10 < 6(x - 2)$.
5. Solve: $x/2 + 1 \geq 3$.
6. Solve: $7 \leq (3x - 11)/2 \leq 11$.
7. Solve for x : $-5 \leq (5 - 3x)/2 \leq 8$.
8. Solve $3x + 8 > 2$, where x is a natural number.

Day 6: Permutations and Combinations

1. Evaluate $5!$.
2. Evaluate $7P3$.
3. Evaluate $8C3$.
4. In how many ways can 5 different books be arranged on a shelf?
5. How many 3-digit numbers can be formed from the digits 1, 2, 3 and 4 without repetition?
6. In how many ways can a committee of 3 be chosen from 7 people?
7. How many diagonals does a hexagon have?
8. In how many ways can 6 people be seated around a round table?

Day 7: Binomial Theorem

1. Expand $(x + 2)^3$.
2. Expand $(1 + x)^4$.
3. Write the general term in the expansion of $(a + b)^n$.
4. Find the coefficient of x^2 in the expansion of $(1 + x)^5$.
5. Find the middle term in the expansion of $(x + 1/x)^{10}$.
6. Expand $(2x - 3)^3$.
7. Find the coefficient of x^5 in the expansion of $(x + 3)^6$.
8. Find the number of terms in the expansion of $(a + b)^{10}$.

Day 8: Sequences and Series (Part 1)

1. Find the 8th term of the GP 2, 6, 18, ...

2. Find the sum to n terms of the GP $1 + 2 + 4 + \dots$
3. Find the 5th term of the GP $3, -6, 12, \dots$
4. Find the sum of the first 20 natural numbers
5. Find the sum of the infinite GP: $1 + \frac{1}{2} + \frac{1}{4} + \dots$
6. Find the sum: $1 + 3 + 5 + \dots + 49$.

Day 9: Sequences and Series (Part 2)

1. Find the 12th term of the GP $1, \frac{1}{2}, \frac{1}{4}, \dots$
2. Insert three geometric means between 2 and 32.
3. Find the sum: $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$
4. If the 3rd term of a GP is 24 and the 6th term is 192, find the GP.

Day 10: Mixed Revision

1. If $A = \{1, 2, 3\}$ and $B = \{2, 3, 4\}$, find $A \cap B$ and $A \cup B$.
 2. Find the domain of $f(x) = \frac{1}{(x^2 - 9)}$.
 3. Find the value of $\cos 120^\circ$.
 4. Find the modulus of $1 + i$.
 5. Solve: $4x + 3 < 11$.
 6. Evaluate ${}^6C_2$.
 7. Expand $(x - 1)^3$.
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