

30-Day Math Plan for Machine Learning

Week 1 — Algebra Refresher

Goal: Handle equations, functions, and variables easily.

Day	Topic	Notes / Exercises
1	Variables, constants, basic operations	Solve simple equations
2	Linear equations	$y = mx + b$, slope, intercept
3	Quadratic equations	Solve $ax^2 + bx + c = 0$
4	Functions	$f(x)$ notation, evaluation
5	Exponents & logarithms	log, ln, powers
6	Simple practice problems	Combine linear & quadratic problems
7	Mini test	Solve 10 mixed problems

Week 2 — Basic Statistics

Goal: Understand data, distributions, and probability.

Day	Topic	Notes / Exercises
8	Mean, median, mode	Calculate by hand & with Python
9	Variance & standard deviation	Small datasets
10	Probability basics	$P(A)$, independent events

11	Conditional probability	P(A
12	Correlation & covariance	Understand relationships
13	Common distributions	Normal, uniform, binomial
14	Mini project	Analyze small dataset (pandas)

Week 3 — Linear Algebra Basics

Goal: Handle vectors, matrices, and dot products.

Day	Topic	Notes / Exercises
15	Vectors	Representation, addition, scaling
16	Vector operations	Dot product, magnitude
17	Matrices	Shape, addition, multiplication
18	Matrix multiplication	Practice with 2x2, 3x3
19	Identity & inverse matrices	Small examples
20	Transpose & determinant	Practice
21	Mini test	Combine vectors & matrices

Week 4 — Applied Math for ML

Goal: Connect math to machine learning problems.

Day	Topic	Notes / Exercises
22	Linear regression math	$y = mx + b$, MSE formula

23	Gradient intuition	Slope & direction of change
24	Normalization & scaling	Min-max, z-score
25	Probability in ML	Bernoulli, Gaussian
26	Statistics in ML	Mean, variance for datasets
27	Matrices in ML	Features as vectors, matrix multiplication
28	Review algebra + statistics	Solve mixed problems
29	Review linear algebra	Vectors & matrices practice
30	Mini ML project	Predict using linear regression in Python