Class 9 Maths Chapter 2: Introduction to Linear Polynomials - Notes, Important Questions and MCQs (2026-27)

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These Class 9 Maths Chapter 2 notes cover “Introduction to Linear Polynomials” from the new NCERT textbook Ganita Manjari (Part I, 2026-27): algebraic expressions and polynomials, degree, linear polynomials, linear patterns and their rules, linear growth and decay, linear relationships y = ax + b, slope and y-intercept, and graphs of straight lines – with tables, solved examples, Q&A, 10 MCQs and a free PDF.

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Chapter Overview

An algebraic expression combines numbers, variables and operations. A polynomial in one variable has whole-number powers, and its highest power is its degree. A polynomial of degree one, like 2x + 3, is a linear polynomial.

Linear polynomials model situations that change by a fixed amount each step – taxi fares, savings, matchstick patterns or a candle burning down. A linear relationship y = ax + b is shown as a straight line whose slope a tells how steep it is and whose y-intercept b tells where it cuts the y-axis.

Important Topics and Concepts

Polynomials and Degree

- Terms, coefficients and variables: in $2x^2 + 5xy - 3y^2$, the terms are $2x^2$, $5xy$, $-3y^2$ and coefficients 2, 5, –3.
- A univariate polynomial has one variable, e.g. $x^2 + 5x + 3$.
- The highest power of the variable is the degree.
- Degree 1: linear ($ax + b$, $a \neq 0$); degree 2: quadratic; degree 3: cubic.

Linear Polynomials and Patterns

- A linear polynomial has the form $ax + b$ with $a \neq 0$.
- A linear pattern is a sequence where consecutive terms differ by a constant, e.g. 1, 3, 5, 7, …
- Rule for the nth term: if the first term is f and the common difference is d, the nth term = $d \cdot n + (f - d)$.
- Example: matchstick squares 4, 7, 10, … follow $3n + 1$.

Linear Growth and Linear Decay

- Linear growth: a quantity increases by a fixed amount in equal intervals (savings of ₹50 every week).
- Linear decay: a quantity decreases by a fixed amount (water draining at 2 litres per minute).
- Growth gives a line with positive slope; decay gives a line with negative slope.

Linear Relationships y = ax + b

- A linear relationship between x and y is written $y = ax + b$.
- a is the slope – the change in y for each unit increase in x.
- b is the y-intercept – where the line cuts the y-axis (at (0, b)).
- If $b = 0$, the line $y = ax$ passes through the origin.
- A larger $|a|$ gives a steeper line.

Graphing Linear Relationships

- Make a table of at least two or three (x, y) values.
- Plot the points on the coordinate plane and join them with a straight line.
- Lines with the same slope a but different b are parallel.
- The line meets the x-axis where $y = 0$, i.e. at $x = -b/a$.

Solved Examples

Board-pattern practice.

- Find the degree of $7x^3 - 2x + 9$. Highest power is 3, so degree 3.
- Find the rule for 5, 9, 13, 17, … $d = 4$, first term 5 → nth term $= 4n + 1$.
- A taxi charges ₹40 plus ₹12 per km. Write the fare rule. $y = 12x + 40$ (slope 12, intercept 40).
- Slope and intercept of $y = -3x + 6$. Slope –3 (decay), y-intercept 6; meets x-axis at $x = 2$.
- Line through (2, 3) and (6, 11). Slope $= (11-3)/(6-2) = 2$; $3 = 2 \cdot 2 + b \rightarrow b = -1$; $y = 2x - 1$.

Reading y = ax + b

Feature	Meaning	Example y = 2x + 3
a (slope)	Change in y per unit x	2
Sign of a	+ growth, – decay	Growth
b (y-intercept)	Cuts y-axis at (0, b)	(0, 3)
x-intercept	Where y = 0: x = –b/a	(–1.5, 0)
Parallel lines	Same a, different b	y = 2x – 5

Important Terms and Formulas

Term	Meaning
Algebraic expression	Combination of numbers, variables and operations
Polynomial	Expression with whole-number powers of variables
Degree	Highest power of the variable
Linear polynomial	Polynomial of degree 1: ax + b
Linear pattern	Sequence with constant difference
Linear growth	Increase by a fixed amount each step
Linear decay	Decrease by a fixed amount each step
Slope	a in y = ax + b
y-intercept	b in y = ax + b
Parallel lines	Lines with equal slopes

Short Answer Questions

Q1. What is a linear polynomial? Give an example.

A polynomial of degree 1, e.g. 5 – 4y.

Q2. Find the degree of $4x^2 + 3x – 1$.

2.

Q3. What is the nth term of 2, 5, 8, 11, ...?

3n – 1.

Q4. Differentiate between linear growth and linear decay.

Growth increases by a fixed amount each step; decay decreases by a fixed amount each step.

Q5. What do a and b represent in y = ax + b?

a is the slope and b is the y-intercept.

Q6. When does a line pass through the origin?

When b = 0, i.e. y = ax.

Q7. Are y = 4x + 1 and y = 4x – 7 parallel?

Q8. Where does y = 3x – 6 meet the x-axis?

At x = 2, i.e. (2, 0).

Long Answer Questions

Q1. A water tank has 200 litres and drains at 8 litres per minute. Model and analyse it.

Let t = minutes, W = water left: W = 200 – 8t.

Slope –8 shows linear decay.

y-intercept 200 is the starting amount.

Tank empties when W = 0: t = 25 minutes.

Graph is a straight line from (0, 200) to (25, 0).

Q2. Explain how to draw the graph of y = 2x + 1 and read its features.

Make a table: x = 0, 1, 2 gives y = 1, 3, 5.

Plot (0, 1), (1, 3), (2, 5).

Join them with a straight line.

Slope 2: y rises 2 for each unit of x.

y-intercept 1; x-intercept –½.

Q3. Find p(x) = ax + b whose graph passes through (2, 3) and (6, 11), and a parallel line through (4, –1).

Slope a = (11 – 3)/(6 – 2) = 2.

3 = 2(2) + b gives b = –1, so p(x) = 2x – 1.

Parallel line has slope 2: q(x) = 2x + d.

–1 = 2(4) + d gives d = –9, so q(x) = 2x – 9.

x-intercepts: p at ½, q at 9/2.

MCQs with Answers

1. Degree of a linear polynomial is(a) 0 (b) 1 (c) 2 (d) 3Answer: (b) 1

2. Which is a linear polynomial?(a) $x^2 + 1$ (b) 3x – 7 (c) x^3 (d) 1/xAnswer: (b) 3x – 7

3. Slope of y = 5x – 2 is(a) –2 (b) 5 (c) 2 (d) –5Answer: (b) 5

4. y-intercept of y = 5x – 2 is(a) 5 (b) –2 (c) 2 (d) 0Answer: (b) –2

5. A line with negative slope shows(a) linear growth (b) linear decay (c) no change (d) curveAnswer: (b) linear decay

6. nth term of 3, 7, 11, 15 is(a) 4n – 1 (b) 3n + 4 (c) 4n + 3 (d) n + 3Answer: (a) 4n – 1

7. y = 3x passes through(a) (0, 3) (b) (0, 0) (c) (3, 0) (d) (1, 0)Answer: (b) (0, 0)

8. Lines y = 2x + 1 and y = 2x + 9 are(a) perpendicular (b) parallel (c) same (d) intersecting at originAnswer: (b) parallel

10. x-intercept of y = 2x – 8 is(a) 8 (b) 4 (c) –4 (d) –8Answer: (b) 4

Quick Revision Points

- Polynomial, terms, coefficients, degree.
- Linear: ax + b (a ≠ 0).
- Linear pattern: constant difference; nth term = dn + (f – d).
- Growth (+ slope) vs decay (– slope).
- y = ax + b: slope a, y-intercept b.
- Same slope → parallel lines.

Chapter Summary

Polynomials are algebraic expressions with whole-number powers; the highest power is the degree, and degree-one polynomials ax + b are linear. Linear patterns change by a constant amount, so their nth term follows a linear rule.

Linear relationships y = ax + b describe linear growth (positive slope) or decay (negative slope). Their graphs are straight lines: a is the slope, b the y-intercept, lines with equal slopes are parallel, and the line passes through the origin when b = 0.

Exam Tips and PYQ Pattern

- Practise finding nth-term rules from patterns.
- Always state slope and intercept when asked about a line.
- Draw tables before plotting graphs.
- Use real-life examples (fares, tanks) in word problems.
- Check your line by substituting a point.

Frequently Asked Questions

Is this chapter in the 2026-27 CBSE syllabus?

Yes. It is part of the new NCERT Class 9 Maths textbook “Ganita Manjari” (Part I), prescribed for the 2026-27 session.

Can I download these notes as a PDF?

Yes. Use the free PDF link at the top of this page – no signup needed.

What is a linear polynomial?

A polynomial of degree one, of the form ax + b where a ≠ 0.

What are slope and y-intercept?

In y = ax + b, a is the slope (steepness) and b is the y-intercept (where the line cuts the y-axis).

Conclusion

Introduction to Linear Polynomials connects patterns, algebra and graphs. Learn the slope–intercept table, practise the solved examples here and save the free PDF for revision.

More Notes: Class 9 Maths Chapter 1: Orienting Yourself: The Use of Coordinates notes | Class 9 Maths Chapter 3: The World of Numbers notes | All Class 9 Maths notes

Author Bio: Written and reviewed by the Nextoper Editorial Team, a group of CBSE mathematics educators who build chapter notes directly from the NCERT textbook and past board paper patterns.

Freshness Note: These notes follow the NCERT Class 9 Maths textbook, Ganita Manjari (Parts I and II, first edition 2026, NCF-SE 2023), and the CBSE syllabus for the 2026-27 session. Last checked on 24 November 2026.