

Introduction to Polynomials

CBSE Class 9 Maths · Knowledge organiser

KEY DEFINITIONS

Polynomial

An expression of terms ax^n where every power n is a whole number.

Degree

The highest power of the variable with a non-zero coefficient.

Zero of a polynomial

A value of x that makes $p(x) = 0$.

KEY FORMULAS

Polynomial:

degree =

highest power;

linear

polynomial and

its zero

$$p(x) = ax + b \ (a \neq 0); \ x = -\frac{b}{a}$$

Line $y = ax + b$:

slope a , y -

intercept b

$$a = \frac{y_2 - y_1}{x_2 - x_1}$$

Linear growth ($a > 0$) / decay ($a < 0$): equal change per equal step

YOU SHOULD BE ABLE TO...

- Recognise polynomials and their degree, evaluate $p(c)$ and read slope and intercept from $y = ax + b$.
- Build a linear model from a table or a story and find a zero, a slope or an unknown coefficient.
- Compare two linear models and answer every part of a growth or decay case study.
- Find a line from two conditions, its intercepts and the area it cuts off, and reason about degree.

WORKED EXAMPLE

Find the linear polynomial $p(x)$ with $p(0) = 4$ and $p(3) = 13$.

$$b = 4 \text{ and } 3a + 4 = 13 \Rightarrow a = 3, \text{ so } p(x) = 3x + 4.$$

COMMON MISTAKES

- ✗ Calling $x + \frac{1}{x}$ or $\sqrt{x}$ a polynomial: the powers must be whole numbers.
- ✗ Reading the slope of $y = 5 - 3x$ as 5 : the slope is the coefficient of x , here -3 .
- ✗ Slope as $\frac{x_2 - x_1}{y_2 - y_1}$ (upside down), or mixing the order of the points in numerator and denominator.
- ✗ In word problems, using the value after one step as the starting value b .