Coordinates, sampled motion, and Python expressions — review sheet

Use this after attempting the worked examples and practice. Explain each claim in words before calculating.

Key ideas

- Choose the quantity before choosing a command.
- Displacement subtracts the starting coordinate.
- Average velocity does not reveal unobserved path length.
- Assignment stores a value at execution time.
- Origin shifts and unit conversions give predictable checks.
- A clean run and a bounded explanation belong together.

Common errors and repairs

Divide final position by elapsed time. Subtract the starting position first.

Call displacement/time the true average path speed. It is signed interval-average velocity; path length may be unknown.

Change a unit label alone. Convert the numerical values too.

Retrieve without your notes

- A moves from 5 to -1 mm in 3 s. What is its average velocity?
- What does an origin shift change?
- What does a clean kernel run establish?

Readiness check

- Separate final position, displacement and interval-average velocity in a stated question.
- Use numerical values, text labels, assignment and list indices to calculate a quantity with units.
- Predict how changing a coordinate origin or length unit changes a result.
- Distinguish observed points from unobserved motion between samples.
- Restart and rerun a short notebook and explain its scientific limits.