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Scientific Notation

Problem 1: Cosmic Distances

In our universe, distances can be incredibly vast. The distance from Earth to the Andromeda Galaxy is approximately 2.537 million light-years. A light year is the distance light travels in a year. Recall that the speed of light is 2.998×10^8 m/s. How far is Andromeda in meters? Feel free to use a calculator, but show intermediate steps.

Vectors and Scalars

Problem 2: Swimming across the hudson

Imagine you're standing on the New Jersey side of the Hudson River, and you want to swim directly across to New York, which is 1 km across. You're a brave swimmer who does 3 km / hr. However, the river's current is quite strong, flowing from North to South at a speed of 5 km / hr. Draw a picture to illustrate the problem. Then calculate the following:

The time it takes you to cross the river in minutes?
How far south of your starting point will you reach on the New York side in km?
The distance between your starting point in New Jersey and your ending point in New York in km?