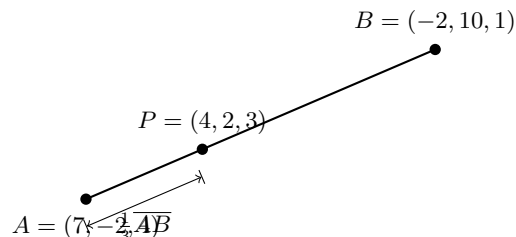


Question 9

Find the point one-third of the way from $A = (7, -2, 4)$ to $B = (-2, 10, 1)$.

Question 9 – Solution

Strategy Identify the initial and terminal information first. Build the vector by subtracting coordinates, then use the magnitude formula or normalize only after the components are correct.



Step 1 The displacement from A to B is $B - A = \langle -9, 12, -3 \rangle$.

Step 2 One-third of this displacement is $\langle -3, 4, -1 \rangle$.

Step 3 Starting at A gives $A + \frac{1}{3}(B - A) = \boxed{(4, 2, 3)}$.

Verification The result follows from the defining vector formulas used above, and each component, magnitude, or scalar condition has been checked against the information in the question.

Key idea A vector separates two ideas: its components describe displacement, while its magnitude and unit vector describe size and direction. Always check signs and confirm that a unit vector has magnitude 1.