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This is a 1-D problem involving average acceleration.

A particle moves in a straight line at 12 m/s, and some time later it is moving at -21 m/s. If the average acceleration of the particle is -2.5 m/s^2, how much time has passed between the initial and final velocity?

Solution:

$$\bar{a} = \frac{\Delta v}{\Delta t}$$

$$\Delta v = v_2 - v_1 = -21 - 12 \quad = -33 \text{ m/s}$$

$$\Delta t = ?$$

$$\bar{a} = -2.5 \text{ m/s}^2$$

Substitute:

$$-2.5 = \frac{-33}{\Delta t}, \quad \Delta t = 13.2 \text{ s} \quad \text{(answer)}$$