

## Current of a River - Word Problem

Example:

It took John 8h to row 40 km upstream.

The return trip, with the aid of the current, took 5h. Find the speed of the current.

Let  $x$  represent the speed of the current.

Let  $y$  represent the rowing speed in  
Still water

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

$$y - x = \frac{40}{8} \rightarrow \begin{cases} y - x = 5 & \textcircled{1} \\ y + x = 8 & \textcircled{2} \end{cases}$$

$$y + x = \frac{40}{5}$$

$$\textcircled{2} - \textcircled{1}: 2x = 3, \quad x = \frac{3}{2} = 1.5 \frac{\text{km}}{\text{h}}$$

Example: Determine how many lattice points lie on the line:  $17x + 34y = 160$

$(x, y)$  is a lattice iff  $x, y \in \mathbb{Z}$

$$17(x + 2y) = 160$$

if  $x, y \in \mathbb{Z}$ , so  $(x + 2y)$  and  $RS$  is an (integer) multiple of 17. But 160 is not.