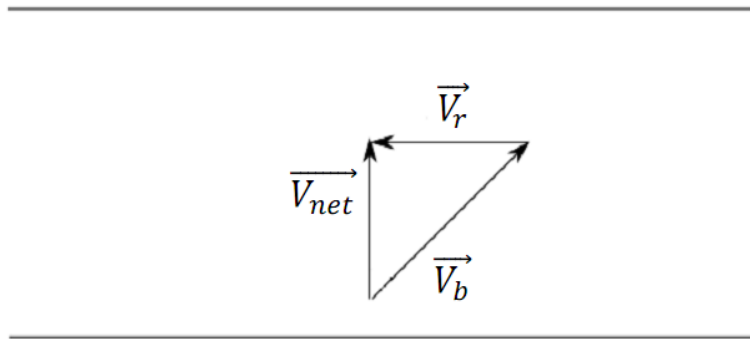


## Answer on Question 51940, Physics, Other

### Question:

A boat propelled so as to travel with a speed of  $0.50\text{ m/s}$  in still water, moves directly (in a straight line) across a river that is  $60\text{ m}$  wide. The river flows with a speed of  $0.30\text{ m/s}$ . How long in seconds does it take the boat to cross the river?

### Solution:



Let the  $\vec{V}_b$  is the boat speed in still water,  $\vec{V}_r$  is the speed of the river and  $\vec{V}_{net}$  is the net speed of the boat, and let's build the vector diagram. In order to find  $\vec{V}_{net}$  we apply the Pythagorean theorem:

$$V_{net} = \sqrt{(V_b)^2 - (V_r)^2} = \sqrt{\left(0.5 \frac{\text{m}}{\text{s}}\right)^2 - \left(0.3 \frac{\text{m}}{\text{s}}\right)^2} = 0.4 \frac{\text{m}}{\text{s}}.$$

Now when we obtain the net speed of the boat, we can find the time that take the boat to cross the river:

$$t = \frac{S}{V_{net}} = \frac{60\text{m}}{0.4 \frac{\text{m}}{\text{s}}} = 150\text{s}.$$

### Answer:

$$t = 150\text{s}.$$

