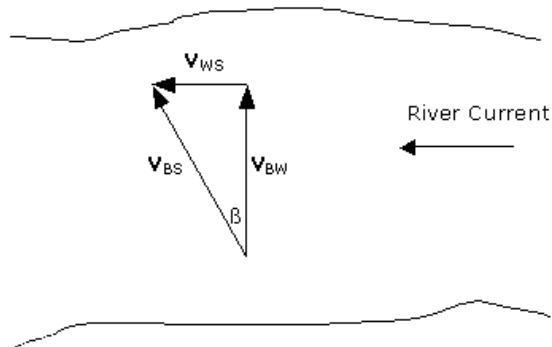## Answer on Question #48140, Physics, Other

If a boat can motor 2.3 m/s in still water, and it attempts to cross a river with a current of 1.5 m/s, what will be the boat's velocity relative to the shore?

Solution:

The boat velocity relative to the shore V_{BS}, is the sum of its velocity relative to the water V_{BW}, and the water velocity relative to the shore V_{WS} :

$$v_{BS} \;=\; v_{BW} \;+\; v_{WS}$$

As V_{BW} and V_{WS} are the sides of a rectangular triangle,
$$v_{BS}^2 = v_{BW}^2 + v_{WS}^2$$
$$v_{BS}^2 = 2.3^2 + 1.5^2 = 7.54$$

Thus,
$$v_{BS} = \sqrt{7.54} = 2.75 \text{ m/s}$$

Answer: $v_{BS} = 2.75 \text{ m/s}$