Answer on Question#53249 - Physics - Mechanics - Kinematics - Dynamics

A canoeist can paddle a maximum speed of $v = 6.4\ \mathrm{m/s}$ in still water. The canoeist starts on the north shore of the river and attempts to paddle to the south shore 225m away, the river is flowing $v_{\parallel} = 2.45\mathrm{m/s}$ [E]. The canoeist always remains at a right angle to the north shore. Determine the resultant velocity of the canoeist, relative to the shore.

Solution:

Since the canoeist remains at a right angle to the north shore, the west component of his velocity (which compensates the flow of the river) is equal to the speed of the river (2.45m/s). Therefore its net velocity is given by

$$v_{\perp} = \sqrt{v^2 - v_{\parallel}^2} = \sqrt{\left(6.4\frac{\mathrm{m}}{\mathrm{s}}\right)^2 - \left(2.45\frac{\mathrm{m}}{\mathrm{s}}\right)^2} = 5.91\frac{\mathrm{m}}{\mathrm{s}}$$

Answer: $5.91\frac{\mathrm{m}}{\mathrm{s}}$.