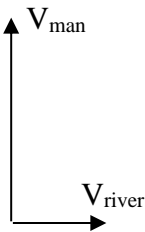Question #79129, Physics / Classical Mechanics
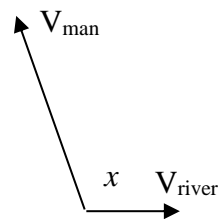
A river is flowing from west to east at 1m/s.The direction man must swim at 2m/s in order to cross the river along 1)shortest path 2)shortest distance?

Solution

1) For the shortest distance, the man should swim at 90° to the river flow.

2) For the shortest path, the man should swim at an angle so that its component along the river flow will cancel out the river speed.

The angle is determined as follows.

$V_{man} \cos x = -V_{river}$;

$2\cos x = -1$;

$\cos x = -0.5$;

$x = 120°$