

Vectors ex 3:

Mike swims north across a river 1.20 Km wide. The river is flowing East and he times a log floating in the river that travels 15.0 m in a time of 25 s. Mike knows he can swim in still water at 1.6 m/s. Find how long it takes to cross, the resultant velocity, and how far downstream he goes?

$V_s = 1.6 \frac{m}{s}$ North
 $+ V_w = \frac{15m}{25s} = 0.6 \frac{m}{s}$ East
 $V_R = 1.71 \frac{m}{s}$ @ 21°

$t = \frac{d}{v} = \frac{1.2 km}{1.6 m/s} = \frac{1200 m}{1.6 m/s} = 750 s$

$V_R^2 = 1.6^2 + 0.6^2$
 $V_R = 1.71$
 $\tan \theta = \frac{V_w}{V_s} = \frac{0.6}{1.6}$
 $\theta = 21^\circ$

$d_{downstream} = V_w t = (0.6)(750) = 450 m$

Mar 19-3:59 PM