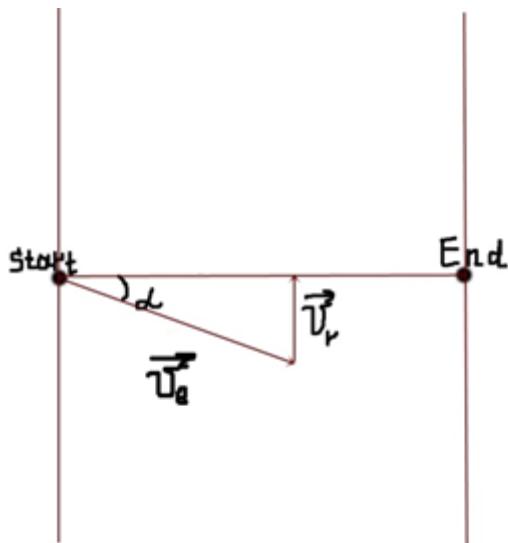


Answer on Question # 47391, Physics, Mechanics | Kinematics | Dynamics

Task:

the velocity of the stream and boat are 6 & 12 km per hour. the width of the river is 10 km. to cross the river across to the shortest distance, in which direction the boat has to move??

Answer:



$$\bar{V}_b = 12 \text{ km/h};$$

$$\bar{V}_r = 6 \text{ km/h};$$

The boat is moving at an angle relative to the perpendicular-line that connects two points on opposite banks, because the current will always reject at a small angle to the direction of flow. Let

$$\text{the angle is } \alpha, \text{ so } \sin \alpha = \frac{6}{12} \Rightarrow \alpha = \arcsin \frac{1}{2}.$$

Therefore the boat is moving at an angle $\alpha = 30^\circ$ against the direction of traffic flow.