A river has a current flowing with a velocity of 2.0 meters per second due east. A boat is

75 meters from the north riverbank. It travels at 3.0 meters per second relative to the river and is headed due north. In the diagram below, the vector starting at point *P* represents the velocity of the boat relative to the river water.

1. Calculate the time required for the boat to cross the river. [Show all work, including the equation and substitution with units.] [2]
2. On the diagram, use a ruler and protractor to construct a vector representing the velocity of the river current. Begin the vector at point *P* and use a scale of 1.0 centimeter = 0.50 meter per second. [1]
3. Calculate the magnitude of the resultant velocity of the boat. [Show all work, including the equation and substitution with units. [2]
4. Construct the resultant velocity vector using a scale of 1.0 centimeter = 0.50 meter per second. The value of the magnitude must be written on your vector. [1]
5. Determine the angle between the resultant velocity of the boat and the current of the river. [1]