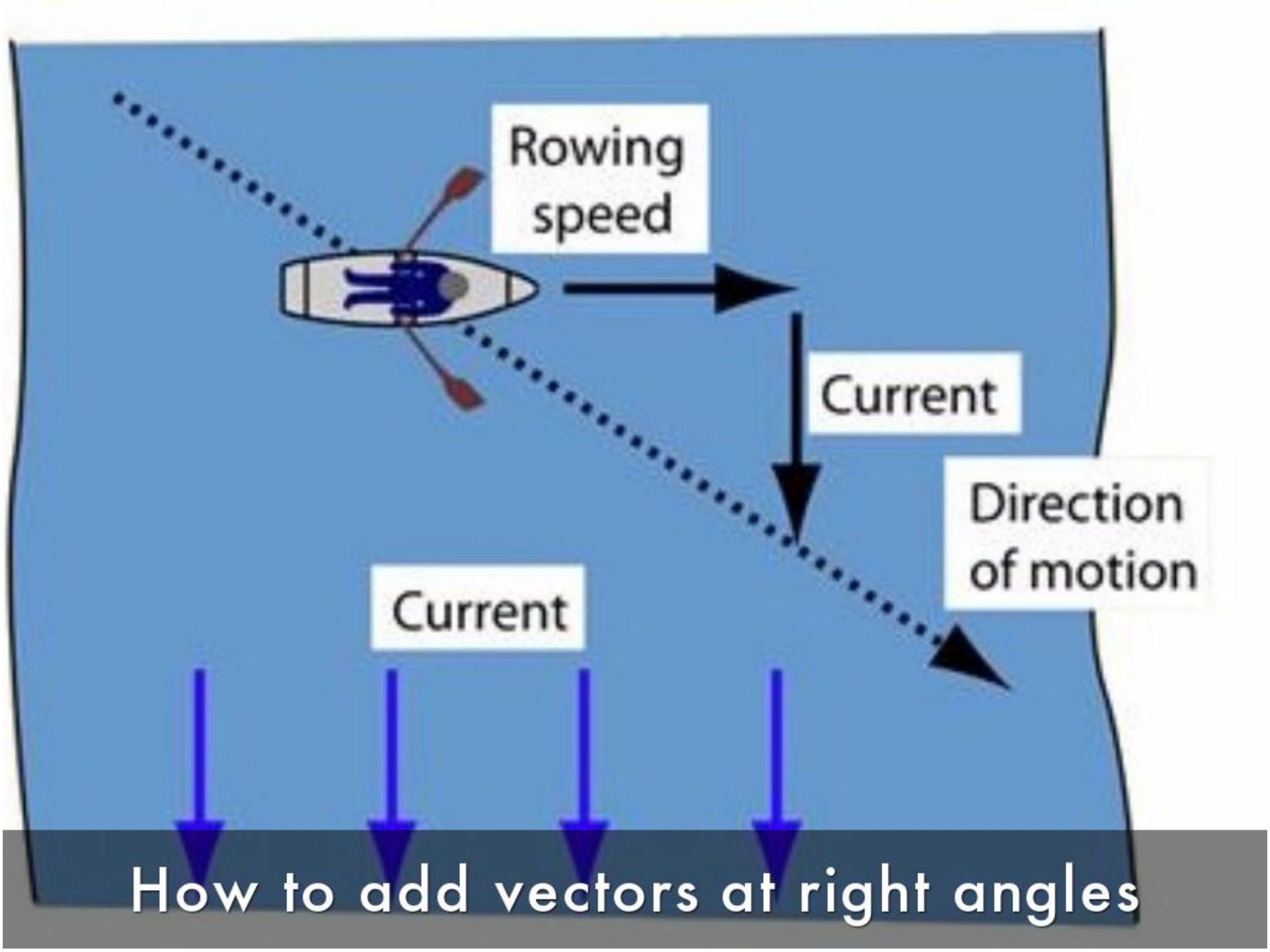
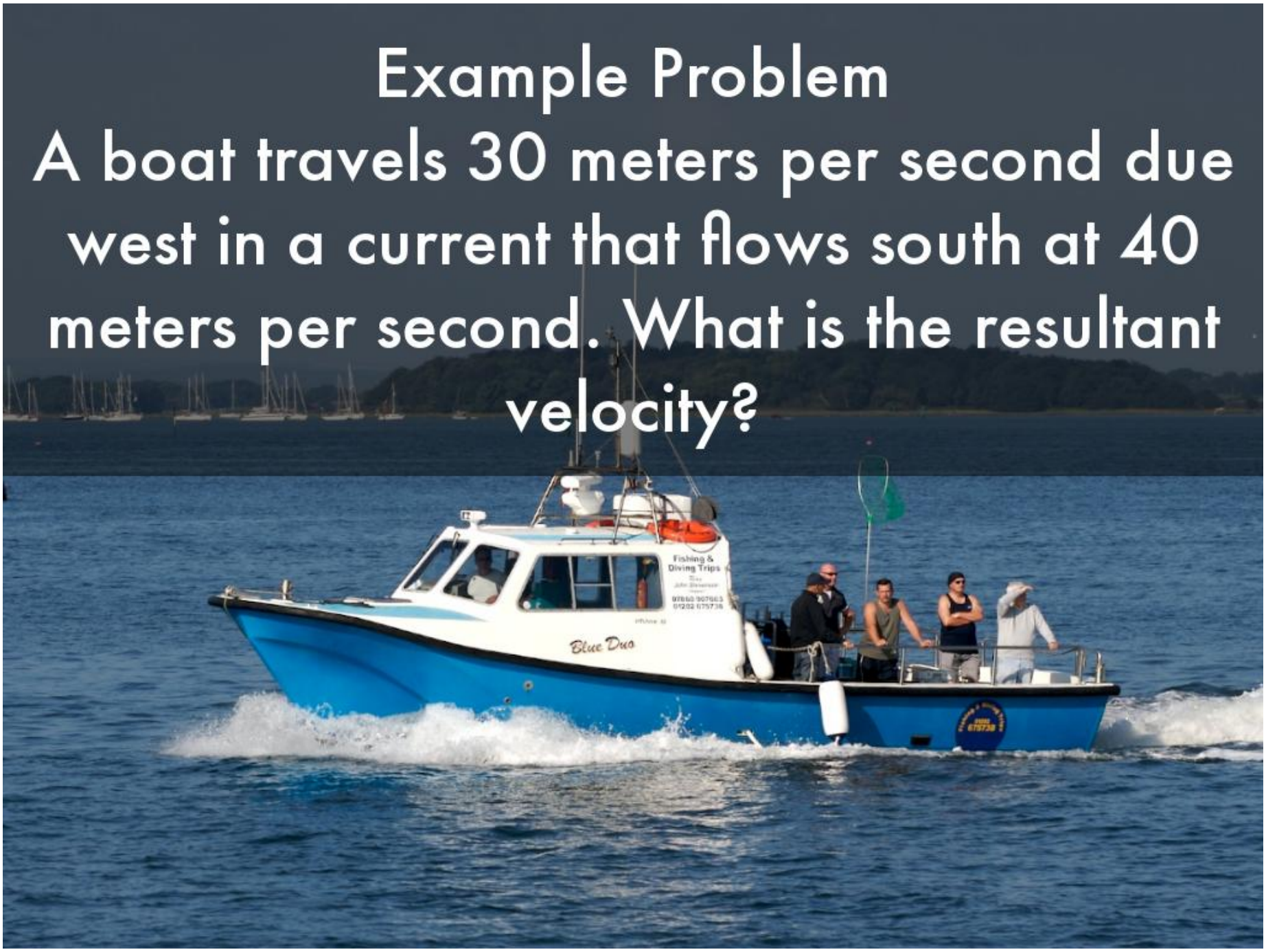
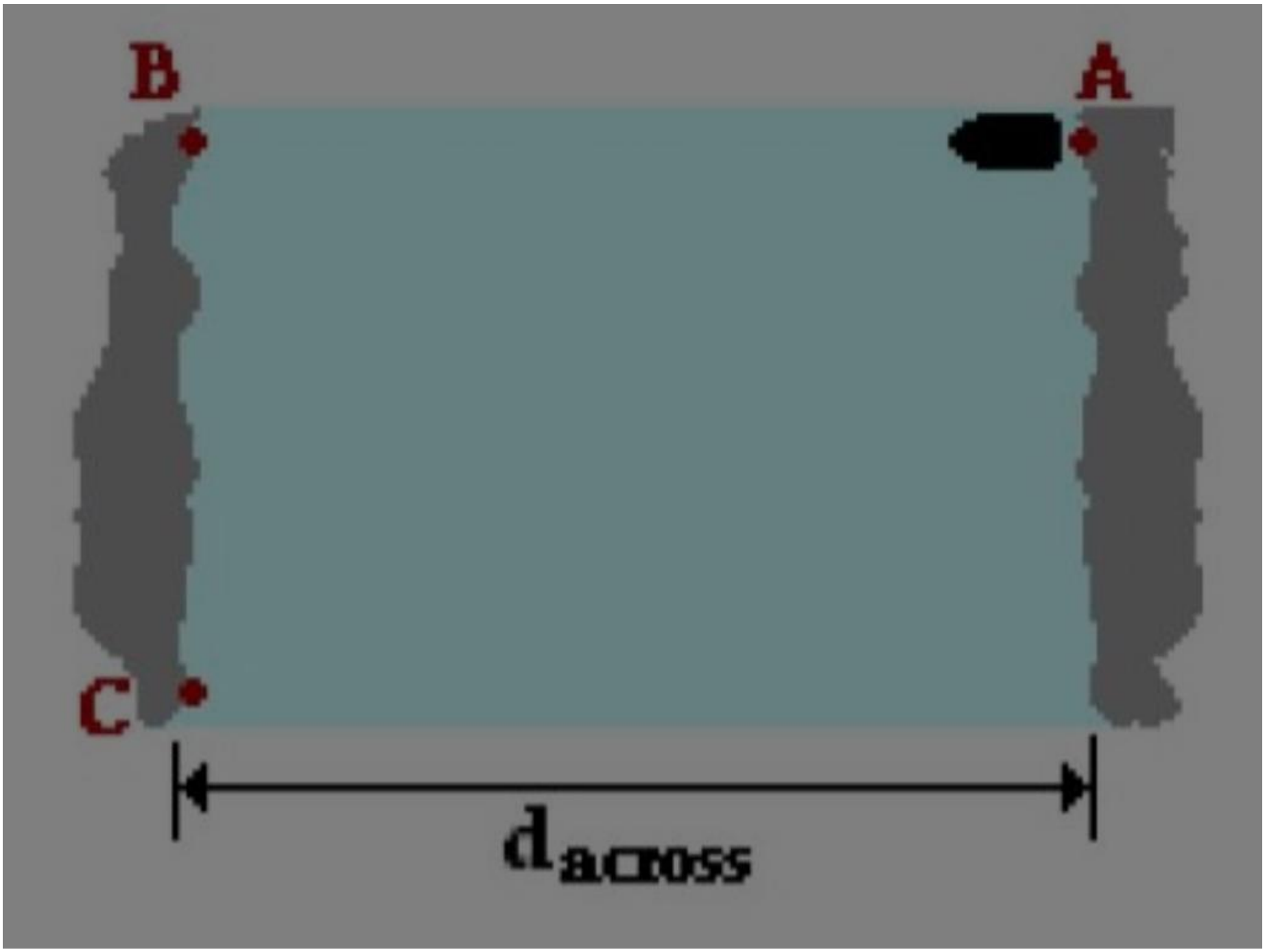


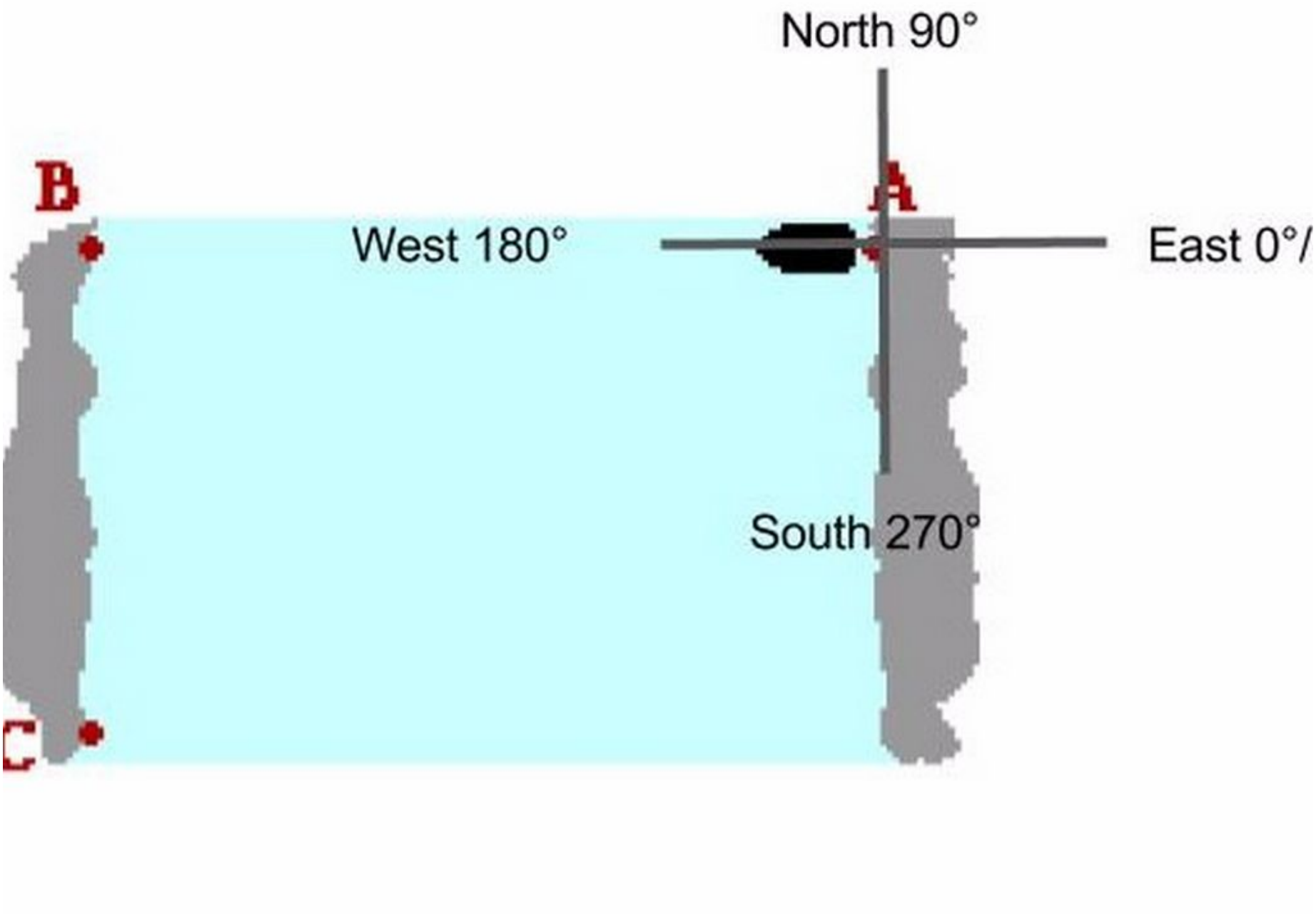
In this presentation students will learn how to solve a vector addition problem for vectors at right angles



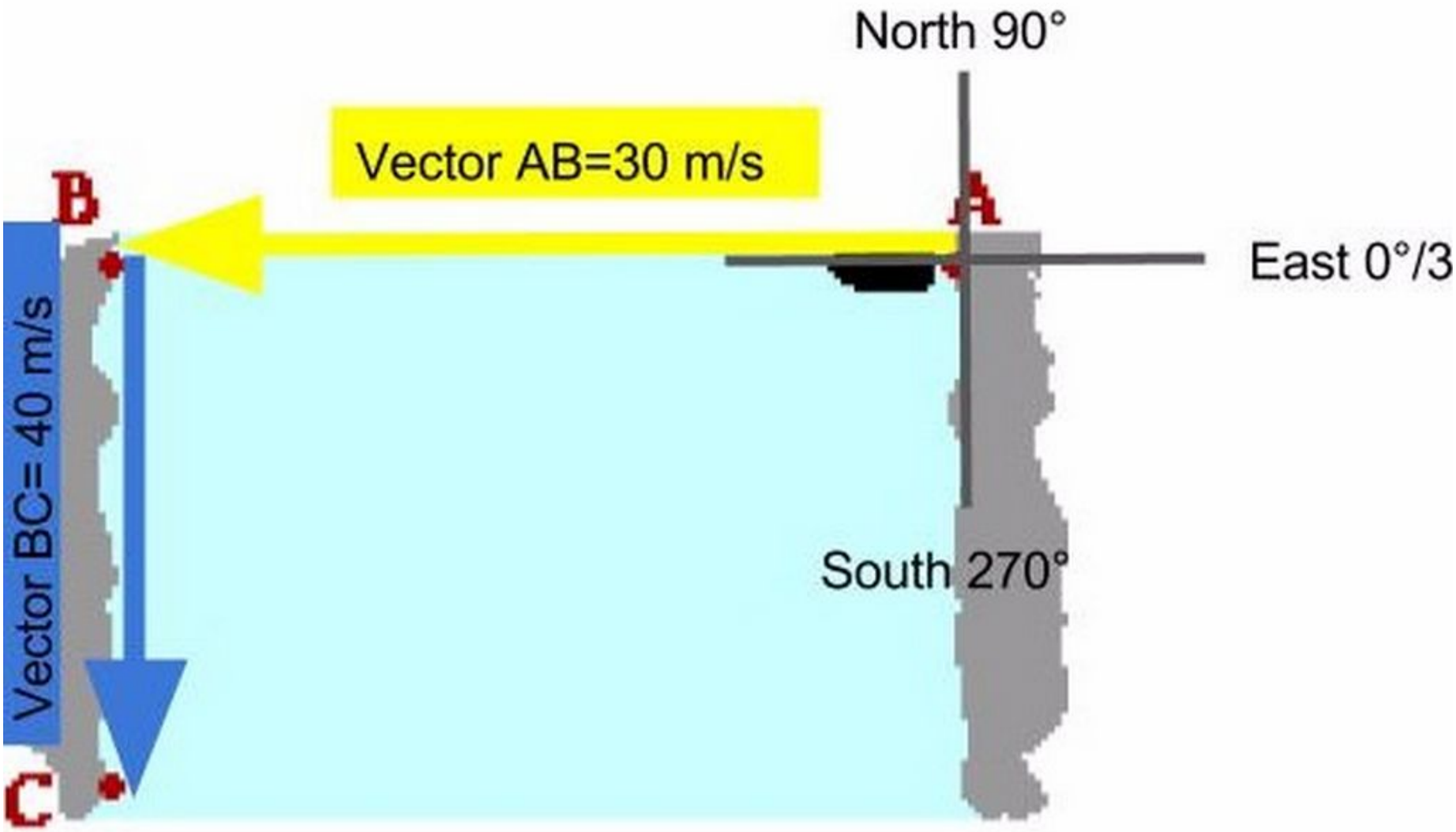
This is a typical vector addition problem. We will walk through the steps to solve.



First step is create a mental image.
Next, identify the quantities and
assign each quantity a variable to represent it.
In this case the Boat speed is Vector AB as it goes from point A to point B.
The River Speed is Vector BC as it flows from point B to point C.
The resultant is the Vector AC, and this is what the boat does when viewed from shore.



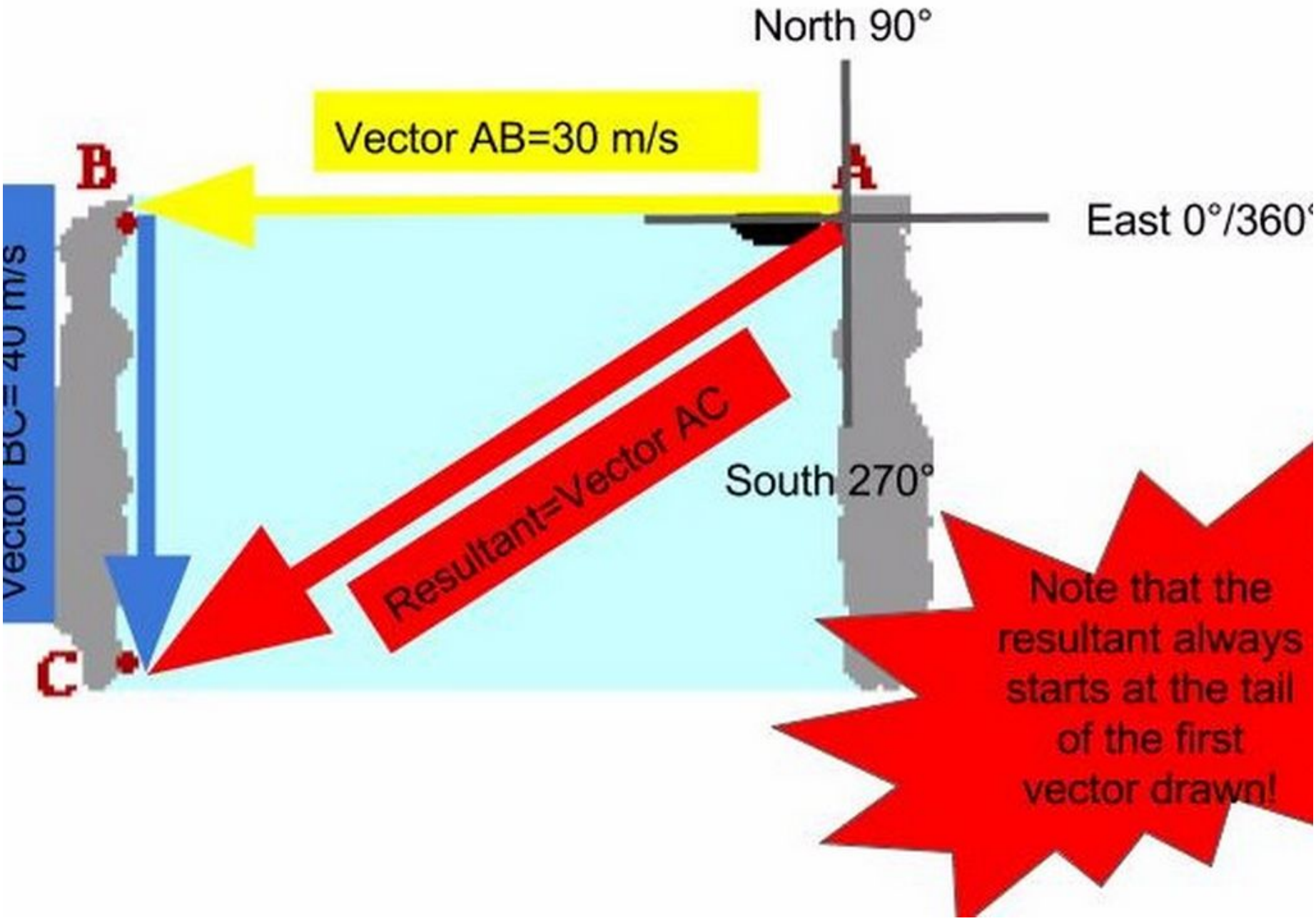
Sketch a compass rose to help with the vector directions. From here you can sketch in your individual vectors.



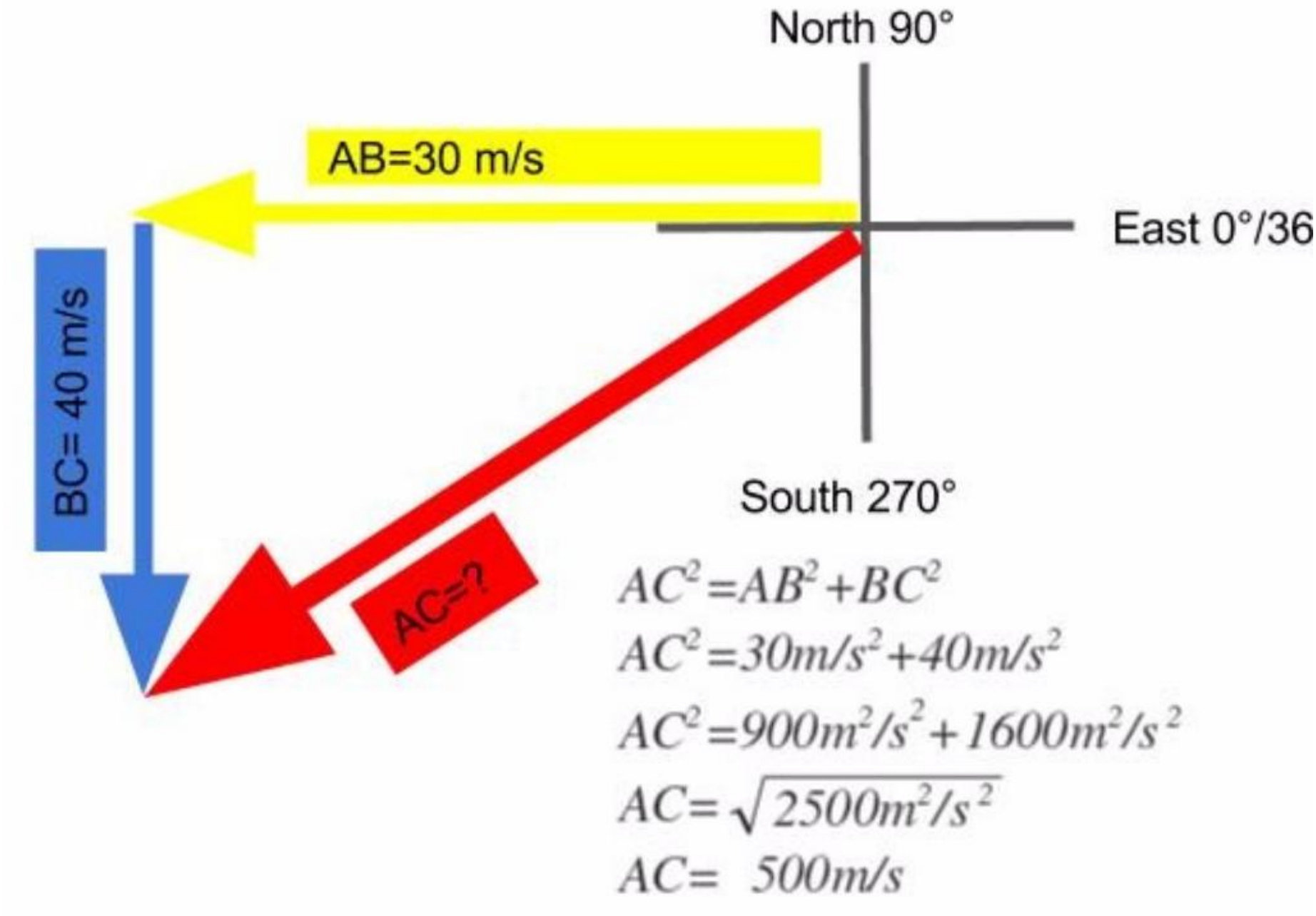
When sketching the vectors always employ the tip to tail method.
Start with the first vector at the origin of the compass rose. Sketch the vector relative size and in correct direction from the origin.

Draw the second vector from the tip (pointy part) of the first vector. Draw the magnitude relative size and in correct direction.

In this example, we draw the boat's velocity first (in yellow). Next, we draw the water's velocity (in blue) from the pointy part of the yellow vector.



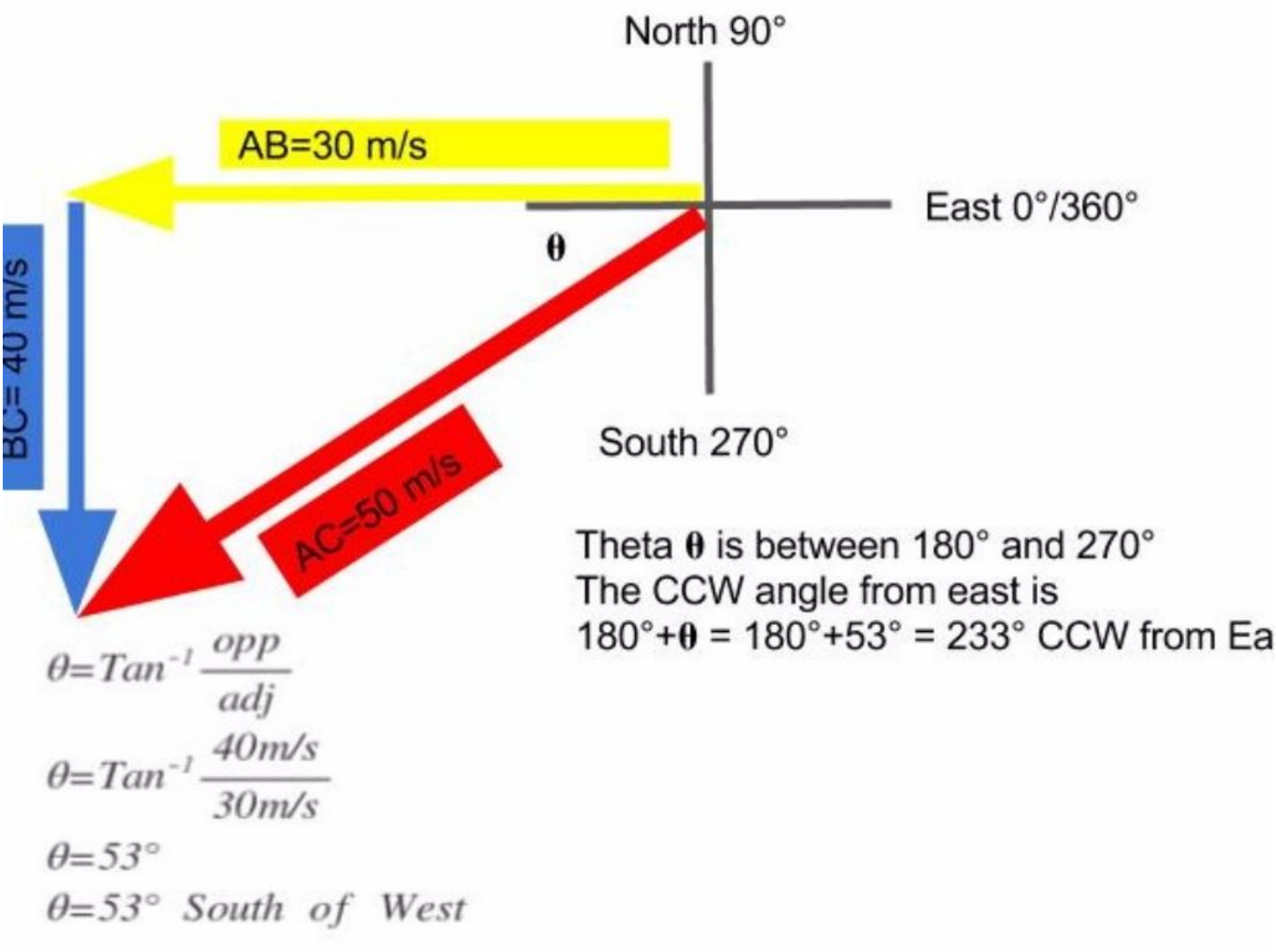
Sketch and label the resultant from the tail of the first vector (the boat's velocity) to the tip (pointy part) of the second vector (the water's velocity).
It is helpful to to draw the resultant in a different color(red).



Now we use right triangle math to find the resultant velocity (both magnitude and direction).

Use Pythagorean theorem for the magnitude of the velocity and Inverse Tangent (tan -1) function for the direction of the velocity.

Using Pythagorean Theorem , we get the magnitude of the velocity is 500 m/s.



Use SOHCAHTOA and the inverse tangent function to find the direction of the vector
The Resultant vector is 50m/s at 53 degrees South of West or 50 m/s at 233 Counter Clockwise from Due east or 50 m/s at 37 degrees West of South.