

### Answer on Question #38796, Physics, Mechanics

#### Question:

What will be the resultant speed of a boat whose heading is 60 degrees with respect to the current and whose speed is 15 km/hr with respect to the water if the current has a speed of 2.0 km/hr and the wind is blowing in a direction of 20 degrees to the current with a speed of 5.0 km/hr?

#### Answer:

Component directed along current equals:

$$v_1 = 2 \frac{km}{h} + 15 * \cos 60^\circ \frac{km}{h} + 5 * \cos 20^\circ \frac{km}{h} = 14.2 \frac{km}{h}$$

Component directed perpendicular to the current equals:

$$v_2 = 15 * \sin 60^\circ \frac{km}{h} + 5 * \sin 20^\circ \frac{km}{h} = 14.7 \frac{km}{h}$$

Therefore resultant speed of a boat equals:

$$v = \sqrt{v_1^2 + v_2^2} = 20.4 \frac{km}{h}$$

Answer:  $20.4 \frac{km}{h}$