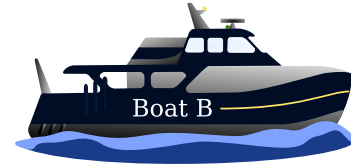


Problem of the Week

Problem C and Solution

Not Much Longer



Problem

On a certain day, the visibility at sea is 5 km. Boats A and B are 200 m apart and travelling in opposite directions, each at a different, constant speed. The two boats are in sight of one another for 15 minutes. If boat A is travelling at a constant speed of 8 km/h, how fast is boat B travelling, in km/h?

Solution

Boat A is travelling at a constant speed of 8 km/h.

Using the formula, distance = speed \times time, in 15 minutes boat A will travel $8 \frac{\text{km}}{\text{h}} \times \frac{15}{60} \text{ h} = 2 \text{ km}$.

The visibility at sea is 5 km, thus boats A and B will be in sight of one another until they are 5 km apart. We are given that boats A and B are in sight of one another for 15 minutes. Thus, after 15 minutes boats A and B must be 5 km apart.

Since boats A and B start out 200 m = 0.2 km apart and boat A travels 2 km in 15 minutes, boat B must travel $5 - 0.2 - 2 = 2.8 \text{ km}$ in 15 minutes.

Since boat B travelled 2.8 km in 15 minutes, using the formula speed = distance \div time, boat B must have been travelling at a speed of $2.8 \text{ km} \div \frac{15}{60} \text{ h} = 2.8 \times \frac{60}{15} = 11.2 \text{ km/h}$.

Therefore, boat B is travelling at a speed of 11.2 km/h.

