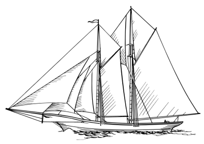
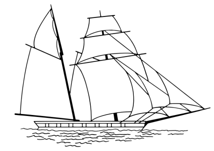


Problem of the Week
Problem C and Solution
See You No More



Problem

Two boats are travelling away from each other in opposite directions. One boat is travelling east at the constant speed of 8 km/h and the other boat is travelling west at a different constant speed.

At one point, the boat travelling east was 200 m east of the boat travelling west, but 15 minutes later they lose sight of each other.

If the visibility at sea that day was 5 km, determine the constant speed of the boat travelling west.

Solution

We will call the boat travelling east Boat A, and the boat travelling west Boat B.

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 $8\,\dfrac{\text{km}}{\text{h}} \times \dfrac{15}{60}\text{ h} = 2$ km.

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

Since Boat A and Boat B start out 200 m = 0.2 km apart and Boat A travels 2 km in 15 minutes, Boat B must travel $5 - 0.2 - 2 = 2.8$ 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 $2.8\text{ km} \div \dfrac{15}{60}\text{ h} = 2.8 \times \dfrac{60}{15} = 11.2$ km/h.

Therefore, Boat B was travelling at a speed of 11.2 km/h.