

Exercise 5

A boat is 100 miles away from the marina, sailing directly toward it at 10 miles per hour. Write an equation for the distance of the boat from the marina after t hours.

Solution

Since the boat is moving at a constant speed, the formula for its distance from the marina is a linear function.

$$d(t) = mt + b \tag{1}$$

Initially, its distance is 100 miles.

$$100 = m(0) + b = b \quad \rightarrow \quad b = 100$$

m is the slope, or the rate at which the boat's distance from the marina increases.

$$m = -10$$

Therefore, the equation for the boat's distance (in miles) is

$$d(t) = -10t + 100,$$

where t is in hours.