Exercise 37

For the following exercises, use the graph in Figure 8, which shows the profit, y, in thousands of dollars, of a company in a given year, t, where t represents the number of years since 1980.
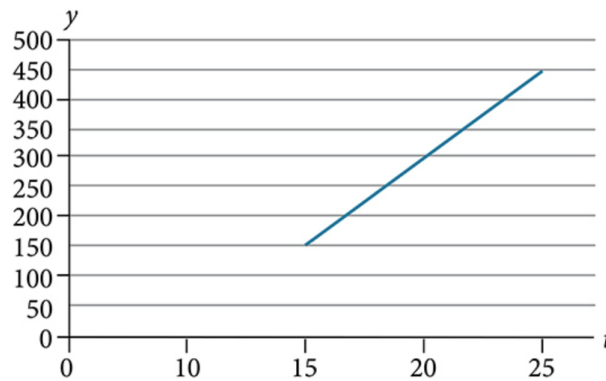

Figure 8

Find and interpret the x-intercept.

Solution

To write an equation for this line, two points on it are needed. Notice that when $t = 15$, $y = 150$, and when $t = 25$, $y = 450$: $(15, 150)$ and $(25, 450)$. Determine the slope first.

$$m = \frac{y_2 - y_1}{t_2 - t_1} = \frac{450 - 150}{25 - 15} = \frac{300}{10} = 30$$

Then use the point-slope formula using either of the two points to get the equation of the line.

$$y - 150 = 30(t - 15)$$

$$y - 150 = 30t - 450$$

$$y = 30t - 300$$

To determine the x-intercept, set $y = 0$ and solve the equation for t.

$$0 = 30t - 300$$

$$-30t = -300$$

$$t = 10$$

Therefore, the x-intercept is $(10, 0)$. This means that in 1990 the company was making \$0 per year, assuming a constant rate of increase.