Exercise 25

In 2004, a school population was 1250. By 2012 the population had dropped to 875. Assume the population is changing linearly.

(a) How much did the population drop between the year 2004 and 2012?

(b) What is the average population decline per year?

(c) Find an equation for the population, P, of the school t years after 2004.

Solution

The population dropped by $1250 - 875 = 375$ from 2004 to 2012. The average population decline per year is the slope of the line going through the two points, $(0, 1250)$ and $(8, 875)$. t is the number of years after 2004.

$$m = \frac{y_2 - y_1}{t_2 - t_1} = \frac{875 - 1250}{8 - 0} = \frac{-375}{8} = -\frac{375}{8}$$

Use the point-slope formula with either of the two points to get the equation of the line.

$$y - 1250 = -\frac{375}{8}(t - 0)$$

$$y - 1250 = -\frac{375}{8}t$$

$$y = -\frac{375}{8}t + 1250$$