

Exercise 29

For the following exercise, consider this scenario: In 2004, a school population was 1,700. By 2012 the population had grown to 2,500.

Assume the population is changing linearly.

- (a) How much did the population grow between the year 2004 and 2012?
- (b) What is the average population growth per year?
- (c) Find an equation for the population, P , of the school t years after 2004.

Solution

The population grew by $2500 - 1700 = 800$ people from 2004 to 2012. The average population growth per year is the slope.

$$m = \frac{y_2 - y_1}{t_2 - t_1} = \frac{2500 - 1700}{2012 - 2004} = \frac{800}{8} = 100$$

Therefore, the average population growth rate is 100 people per year. Use the point $(0, 1700)$ and the point-slope formula to get the equation of the line.

$$y - 1700 = 100(t - 0)$$

$$y - 1700 = 100t$$

$$y = 100t + 1700$$