Exercise 11

For the following exercises, consider this scenario: A town's population has been increased at a constant rate. In 2010 the population was 46,020. By 2012 the population had increased to 52,070. Assume this trend continues.

Predict the population in 2016.

Solution

The population in 2016 can be predicted once the equation of the line is known. Use the two points on this line, $(2010, 46\,020)$ and $(2012, 52\,070)$, to determine the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{52\,070 - 46\,020}{2012 - 2010} = \frac{6050}{2} = 3025$$

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

$$y - 46\,020 = 3025(x - 2010)$$

$$y - 46\,020 = 3025x - 6\,080\,250$$

$$y = 3025x - 6\,034\,230$$

Therefore, in 2016, the population is

$$y = 3025(2016) - 6\,034\,230$$

$$= 64\,170.$$