Exercise 17

For the following exercises, consider this scenario: A town has an initial population of 75,000. It grows at a constant rate of 2,500 per year for 5 years.

When will the output reached 100,000?

[TYPO: Replace "reached" with "reach."]

Solution

Because the town's population grows at a constant rate, a linear function can be used to model it. The slope is 2500, the rate that the town's population increases per year, and the initial population is $75\,000$.

$$P(t) = 2500t + 75\,000$$

Set $P = 100\,000$ and solve the equation for t.

$$100\,000 = 2500t + 75\,000$$

$$25\,000 = 2500t$$

$$10 = t$$

Therefore, the population will be 100,000 ten years after the population is 75,000.