

KEY POINTS

Section 4.1

What is a Function?

- **Function Notation**
- **Independent and Dependent Variables**
- **Evaluating Functions**
- **Using Units to Interpret Functions**
- **Representing Functions Using Tables and Graphs**

Warm - Up

Section 4.1

What is a
Function?

$$-5(x + 9) - 8 \geq 32$$

$$-5x - 45 - 8 \geq 32$$

$+8 \quad +8$

$$-5x - 45 \geq 40$$

$+45 \quad +45$

$$x \geq -17$$

$$-5x \geq 85$$

$-5 \quad -5$

$$x \geq 5$$

$$x \leq -17$$

Vocabulary

Section 4.1

What is a
Function?

Function Notation

Written as $f(x)$; This does not mean multiplication

When we use this notation x represents the input value and $f(x)$ represents the output value.

x -- is also known as the independent variable, this value occurs no matter what

$f(x)$ -- is also known as the dependent variable, and needs the value of x in order to occur

Discussion

Section 4.1

What is a
Function?

The values for x and $f(x)$ represent points in a plane.

There are various ways that we describe functions, we describe them in the following ways:

- words
- tables
- graphs
- formulas

Examples

WORDS: The population P of a town begins (in year $t=0$) at 5000 people and grows by 250 people every year.

TABLE:

t	0	1	2	3	4	5
P	5000	5250	5500	5750	6000	6250

FORMULA:

$$\text{Population} = \text{starting value} + \text{growth rate} * \# \text{ of years}$$

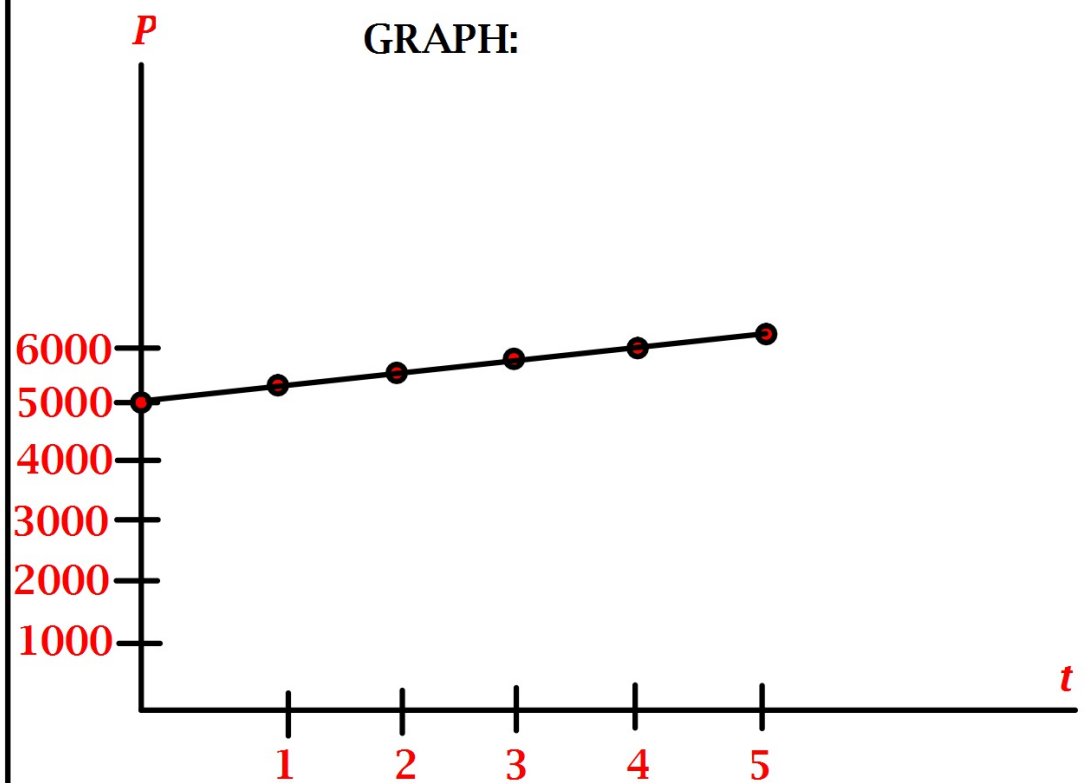
$$P = 5000 + 250t$$

Examples

Section 4.1

What is a
Function?

GRAPH:



Examples

Section 4.1

What is a Function?

Write the first 3 columns shown in the table using function notation.

t	0	1	2	3	4	5
P	5000	5250	5500	5750	6000	6250

$$P(0) = 5000$$

$$P(1) = 5250$$

$$P(2) = 5500$$

$$P(3) = 5750$$

Examples

Section 4.1

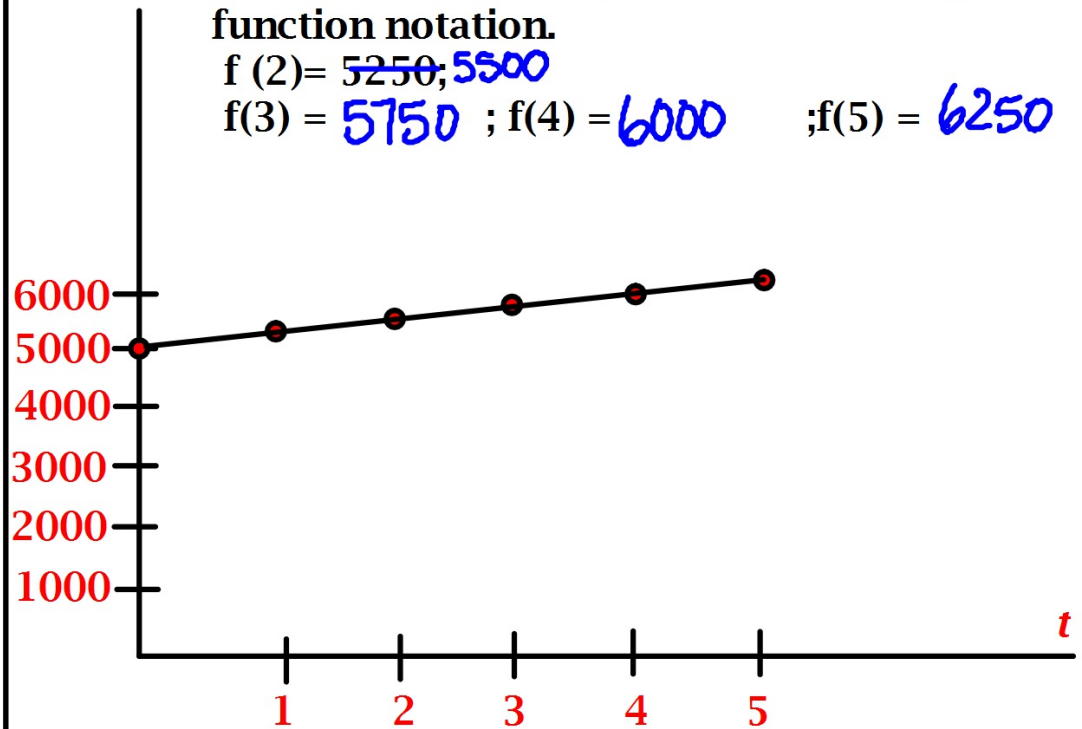
What is a
Function?

P

Write the last three points shown using
function notation.

$$f(2) = \text{5250}; \text{5500}$$

$$f(3) = \text{5750} ; f(4) = \text{6000} ; f(5) = \text{6250}$$



Examples

Section 4.1

What is a Function?

If $P(t) = 5000 + 250t$, answer the following:

a.) Evaluate $P(6)$

$$P(6) = 5000 + 250(6) = 5000 + 1500 = 6500$$

b.) Evaluate $P(2.5)$

$$P(2.5) = 5000 + 250(2.5) = 5000 + 625 = 5625$$

c.) Given the $P(10) = 7500$, explain what the 10 represents and the 7500 represents.

$$10 = 10 \text{ years} \quad 7500 = 7500 \text{ people}$$

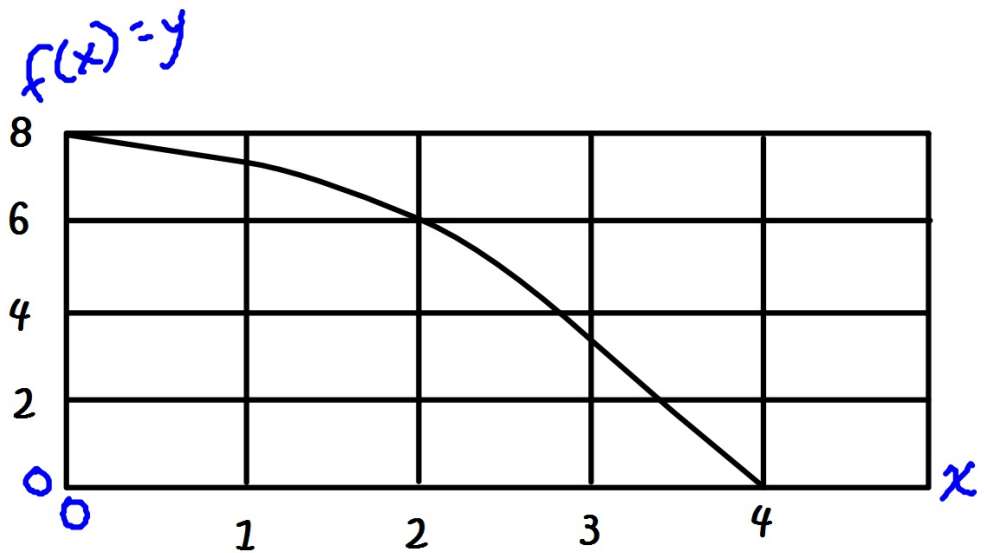
d.) Interpret the meaning of the statement $P(10) = 7500$

After 10 years, the population is 7500 people

Examples

Section 4.1

What is a
Function?



a.) Evaluate $f(0) = 8$

b.) Evaluate $f(2) = 6$

c.) Solve $f(x) = 0$

$$x = 4$$

d.) Solve $f(x) = 2$

$$x = 3.5$$

Examples

Section 4.1

What is a
Function?

Let $f(x) = x^2$. Evaluate and simplify the following.

a. $f(-3) = (-3)^2 = 9$

b. $f(2h) = (2h)^2 = 2h \cdot 2h = 4h^2$

c. $f(x+1) = (x+1)^2 = x \begin{array}{|c|c|} \hline x & +1 \\ \hline x^2 & 1x \\ \hline +1 & x & 1 \\ \hline \end{array} = x^2 + 2x + 1$

d. $f(x+1) - f(-3)$

$$\begin{array}{l} x^2 + 2x + 1 - 9 \\ \hline x^2 + 2x - 8 \end{array}$$

Homework

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#1-25 all, 32

