

# KEY POINTS

## Section 4.3 Functions and Equations

- Solving Equations
- Finding input values that produce a specific output
- Finding input values that make one function equal to another
- Finding input values that make one function larger or smaller than another

# Warm - Up

Section 4.3  
Functions  
and  
Equations

Let  $f(t) = -16t^2 + 32t + 64$ .

Evaluate  $f(6)$

# Background

## Section 4.3 Functions and Equations

Yesterday you worked on finding the output values when given the input values, that is known as evaluating the function.

**Example:**

$$f(x) = x^2, \text{ when } f(3)$$

Today we are going to focus on finding the input values when we are given the output values, which is known as solving an equation.

**Example:**

$$f(x) = x^2 \text{ when } f(x) = 9$$

# Examples

Section 4.3  
Functions  
and  
Equations

So how do we solve the equations?

$$f(x) = x^2, \text{ when } f(3)$$

$$f(x) = x^2 \text{ when } f(x) = 9$$

# Examples

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Equations

For  $h(t) = t^3$ , find the solution to  $h(t) = -8$

If  $f(x) = \frac{(x-3)}{4}$ , find the solution to  $f(x) = 0$

# Examples

## Section 4.3 Functions and Equations

Another place we see functions and equations is in word problems.

The ACME Taxi Company charges a fee of \$2.00 plus \$0.50 per mile. The TOWN Taxi Company charges a fee of \$3.00 plus \$0.30 per mile. Make a table of values to determine the distance for which two companies charge the same fee. For what distances would you choose one company over the other?

X	0	1	2	3	4	5	6

# Warm-Up

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Solve  $f(x) = 9$  for  $x$ .

$$f(x) = 3x - 9$$

$$f(x) = 2(2x - 3) + 3$$

# Examples

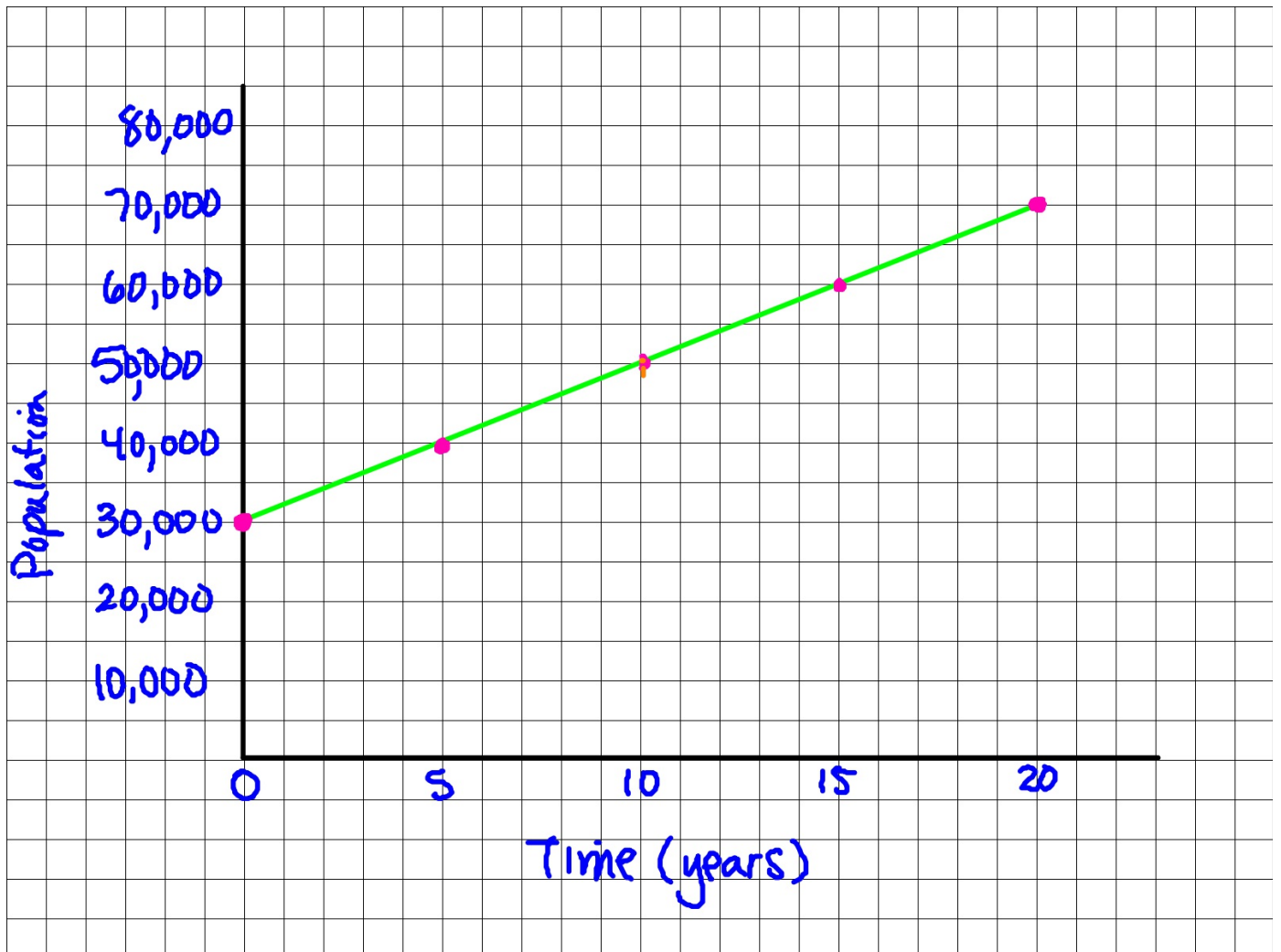
**Section 4.3**  
**Functions**  
**and**  
**Equations**

A town's population  $t$  years after it was incorporated is given by the function  $f(t) = 30,000 + 2000t$

a.) Make a table of values for the population at five-year intervals over a 20-year period starting at  $t=0$ . Plot the results on a graph

b.) Using the table, find the solution the the equation  $f(t) = 50,000$  and indicate the solution on your plot.





# Examples

## Section 4.3 Functions and Equations

The populations, in year  $t$ , of two towns are given by the functions

$$\text{Town } A: P(t) = 600 + 100(t - 2000)$$

$$\text{Town } B: Q(t) = 200 + 300(t - 2000)$$

a.) Write an equation whose solution is the year in which the two towns have the same population.

b.) Make a table of values of the population for the years 2000-2004 and find the solution to the equation in part (a).

# Homework

Section 4.3  
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Pages 93 - 94  
#1-13, 17-20, 28