

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 $f(0)$

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

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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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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

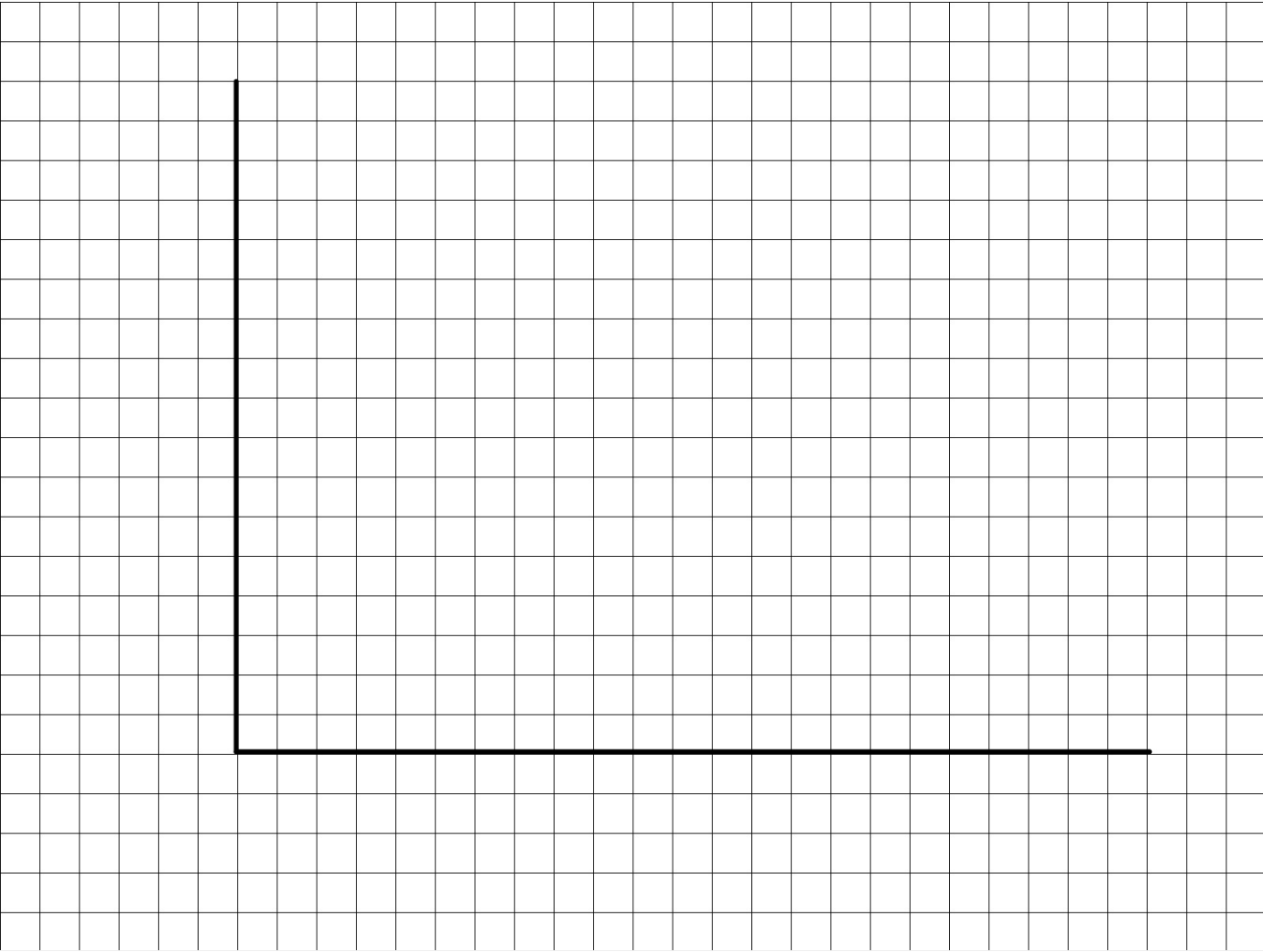
Examples

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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

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#1-13, 17-20, 28

