

KEY POINTS

Section 5.1

Linear Functions

- Definition of a linear function
- Interpreting linear functions
- Initial value and rate of change
- Slope and vertical intercept
- Units

Warm-Up

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Functions

Write down everything you know about linear functions.

Background

Section 5.1 Linear Functions

Linear functions describe quantities that grow at a constant rate, either increasing or decreasing.

This means that the slopes of the graphs are constant.

Linear functions are expressed in two different forms:

$$y = mx + b \quad \text{or} \quad y = b + mx$$

When dealing with linear functions, they will have a **y-intercept**, and **slope**.

y-intercept- represented by **b** in the general function. It is the point where the linear function crosses the y-axis, this means the x-value of the point will be 0. It is a constant value.

slope- represented by **m** in the general function, either positive or negative, known as the rate of change or steepness of the line. It is a constant value.

b & **m** are also known as the parameters for the family.

The function $f(t) = 2.50 + 2.99t$ has $b = 2.50$ and $m = 2.99$. So, 2.50 and 2.99 are the parameters.

Example

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The school-age population P of a school district begins at 1000 children and increases at a constant rate of 50 students per year. Create a table, a graph, and an equation that gives the size of the population over a 50-year period,

Examples

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Linear Functions

The school-age population of another school district is given by $P = 10,000 - 75t$.

- a.) Create a table of values for this function over a 50-year time period.
- b.) Create a graph of the function.
- c.) Explain in words what this formula tells you about the population.

Examples

Section 5.1 Linear Functions

For the following situations, state the values of m and b , and their units. What do they tell you about each situation?

a.) The population of a small island in year t is $200,000 + 4000t$.

b.) The cost (in dollars) of a long-distance phone call lasting n minutes is $1.50 + 0.7n$

Graph $y = 1 + 2x$

Graph $y = 2 - x$

Graph $y = 3 + \frac{1}{2}x$

Homework

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