NONLINEAR FUNCTIONS AND SET THEORY

- A **function** can be in the form of **y = mx + b.** This is an equation of a line, so it is said to be a **linear function**.

- **Nonlinear functions are functions that are not straight lines.** Some examples of nonlinear functions are exponential functions and parabolic functions.

    - An **exponential** function, **y = a^x**, is a curved line that gets closer to but does not touch the x-axis.

    - A **parabolic** function, **y = ax² + bx +c**, is a U-shaped line that can either be facing up or facing down.

- **Graphs** can be used to represent different situations, like a drive on a trip or a ball thrown into the air. In these cases, it is important to read a graph correctly.

- A graph[PREVIEW] re fraction[Please login or register to download the printable version of this study guide.] ifferent units of[www.newpathlearning.com]

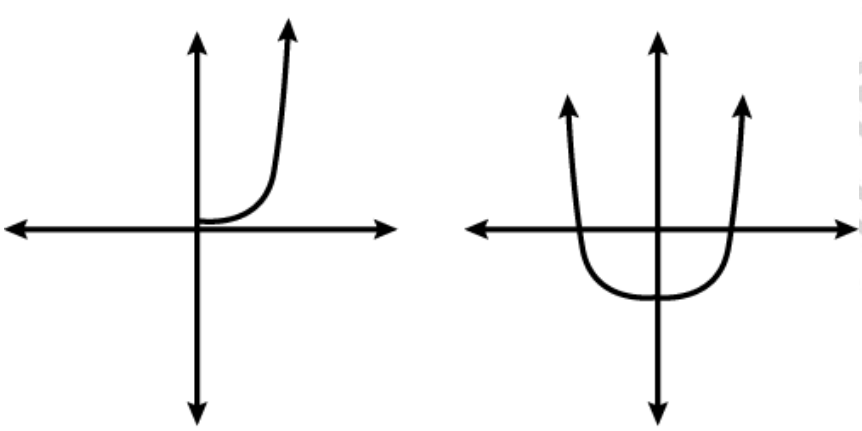
    - **R**[or over a ch][calculating sp][words per minute.]

- **Set theory** refers to a collection of objects in a set and how it can be displayed or manipulated.

    - A Venn diagram displays data in circles showing how much data is in a certain category and how much data overlaps the categories.

How to use nonlinear functions and set theory

Nonlinear functions need to be recognized on a graph. The figures below show the two types of nonlinear functions.



Exp **n**

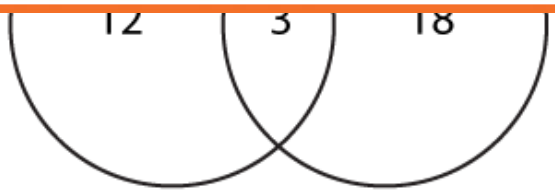
- The y v , can be found b tion.
- **Graphs**
  - A line that goes up means an increase of some sort, like an increase of movement, a ball moving upwards, or a car driving.
  - A horizontal line means no change, like a car that is stopped.
  - A line that goes down means a decrease of some sort; like a decline in speed or temperature. When a graph has two lines that cross, it shows where the two equations are equal.

- **Rates** can be used with speed. If Jon drove 594 miles in 11 hours, his rate of speed would be 54 miles per hour. When comparing two objects with different rates of speed such as miles per hour and feet per second, the rates can be changed as follows:

Ex. $\frac{x \text{ miles}}{1 \text{ hour}} \times \frac{1 \text{ hour}}{60 \text{ min.}} \times \frac{1 \text{ minute}}{60 \text{ sec.}} \times \frac{5280 \text{ feet}}{1 \text{ mile}} = \frac{(x)(5280) \text{ feet}}{(60)(60) \text{ sec.}}$

In the equation, the hours, the minutes and the miles cancel out to leave feet per second with the numbers. So to change 2 mph into ft per second, the answer would be (2)(5280) feet/ (60)(60) seconds or 10,560 ft/3,600 seconds or 2.93 ft/sec.

- **Set theory** is helpful to display an analyze data. With a **Venn diagram**, the data is displayed in circles showing how much data is in a cer many people er of people



- A set has the notation: set A = {x >12}, so for the set of people who like only pizza, the set notation would be, set Only Pizza = {x = 12}. Venn diagrams also can have more than one circle to represent three categories.

Try This!

What kind of function is **y = a^x**?

What kind of function is **y = ax² + bx + c**?

A graph of Joan riding her bike shows a straight horizontal line for two hours. What could that mean?

If Roberto s can he type per m

What is 12

Make a **Venn diagram** that shows:

- people who like only vegetable juice- 5
- people who like only milk- 10
- people who like both- 4