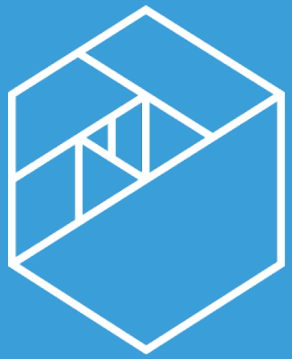

Lesson 2: Functions

Introduction

METIS

Lecture Overview:

Goals of the lecture:

1. Understand functions and how to plot them

Functions

METIS

Functions

Definition:

A function is a rule that assigns to each element from a set (for example x) a unique value (for example y)

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$$f(x) = sin(x) \qquad f(x_1, x_2) = 3x_1 + 2x_2$$

Independent Variables

Definition:

A variable whose variation **does not depend** on that of another

$$f(x) = y = 2x + 1 \qquad f(x) = x^2$$

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Dependent Variables

Definition:

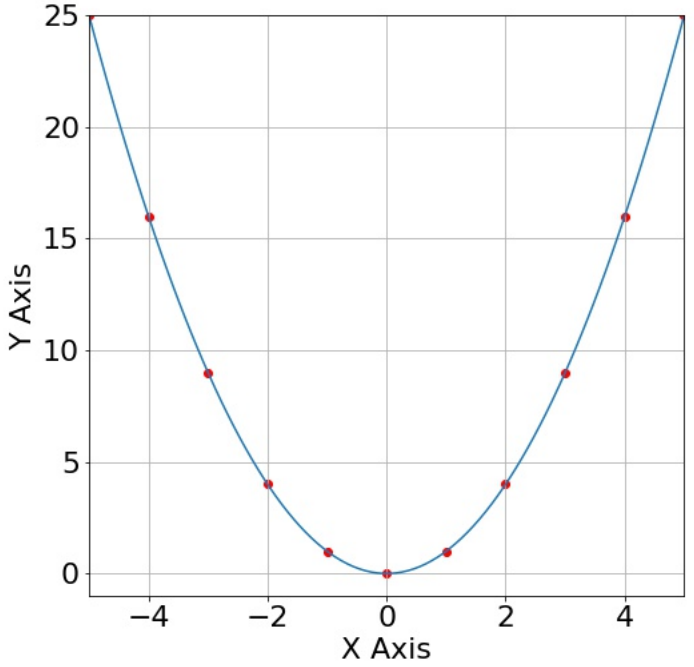
A variable whose variation **depends** on that of another

$$f(x) = y = 2x + 1 \qquad f(x) = x^2$$

$$f(x) = sin(x) \qquad f(x_1, x_2) = 3x_1 + 2x_2$$

Plotting a Function

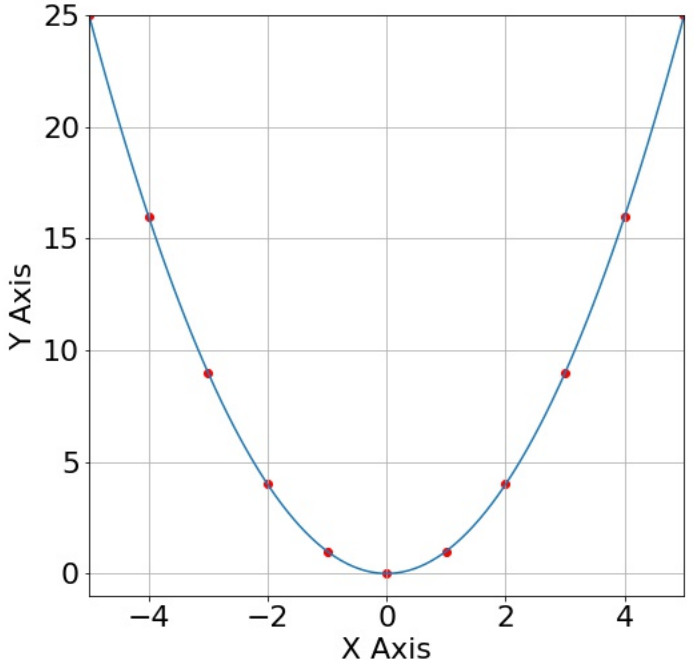
$$f(x) = x^2$$



Plotting a Function

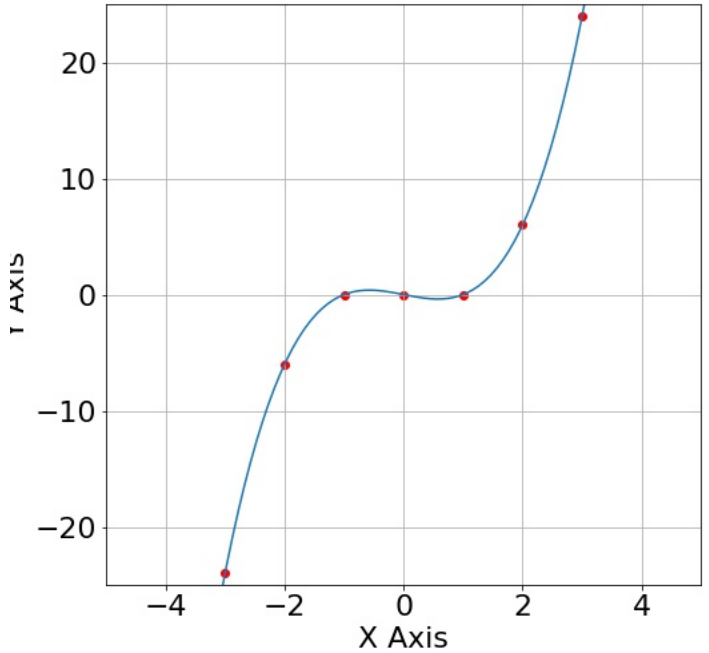
$$f(x) = x^2$$

$$f(-4) = 16$$
$$f(-3) = 9$$
$$f(-2) = 4$$
$$\dots$$



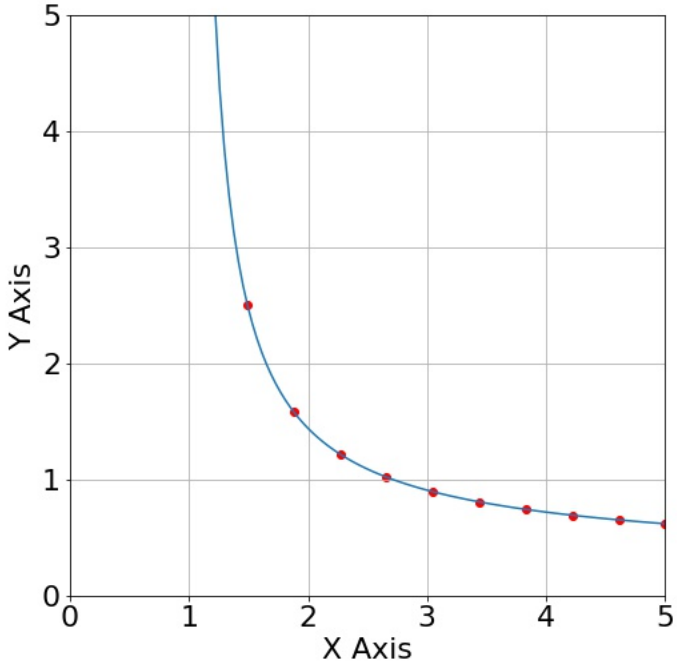
Plotting a Function

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



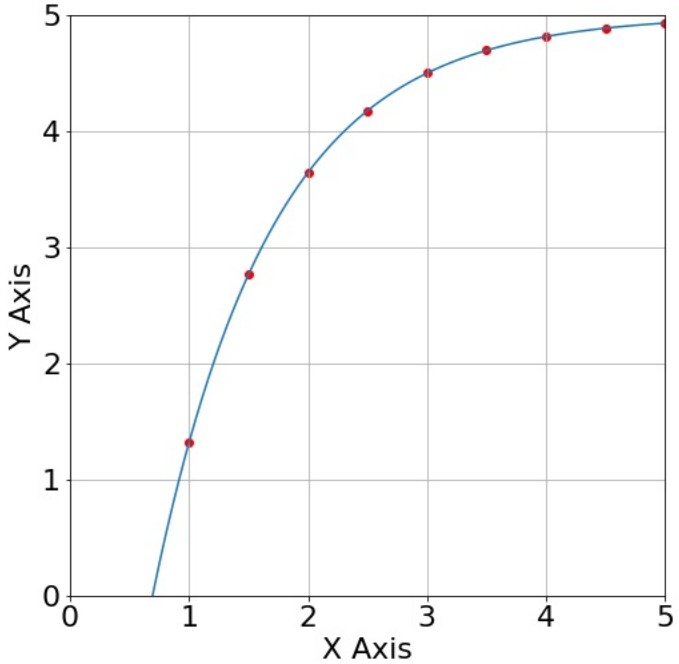
Plotting a Function

$$f(x) = \frac{1}{ln(x)}$$



Plotting a Function

$$f(x) = 5 - 10 \cdot e^{-x}$$



Problem 1:

Problem 1: Plot the following function.

$$f(x) = 2x^2 - 0.5x^3 - 2$$

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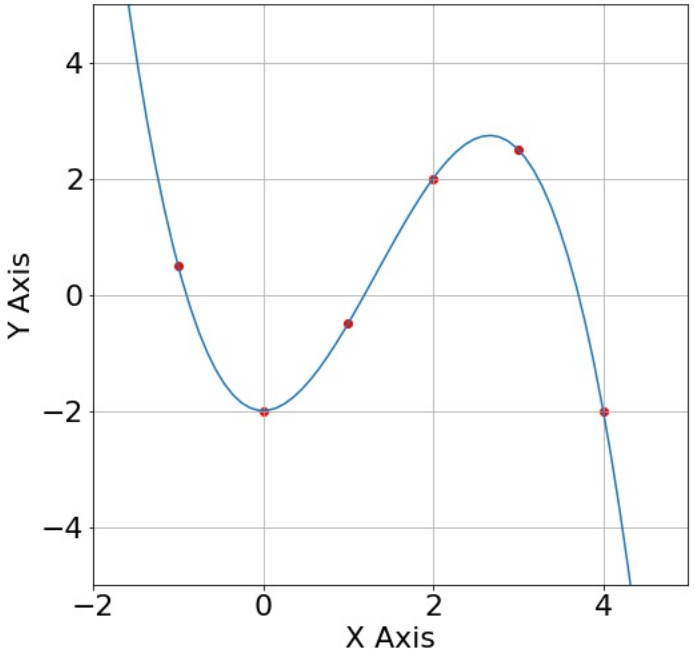
$$f(x) = 2x^2 - 0.5x^3 - 2$$

$$f(-1) = 0.5$$

$$f(0) = -2$$

$$f(1) = -0.5$$

$$f(2) = 2$$



QUESTIONS?