myMath-readme

This project's purpose is to build two types of mathematical expressions and execute calculations and logical methods between them.

Monom

The object monom is a mathematical function defined by the structure a*x^b, so that 'a' is a real number and 'b' is a natural number.

Therefore in monom class I have made an object which generated from two parameters, power (int) and coefficient (double).

Constructor	Description
`Monom(double a, int b)`	This function constructs monom from two parameters.
`Monom(java.lang.String s)`	This function constructs monom from a string.
`Monom(Monom ot)`	This function copys & constructs monom .

Modifier and Type	Method	Description
`void`	`add(Monom ot)`	This function add monom to another monom.
`Monom`	`copy()`	This function execute a deep copy by constructing a new monom.
`void`	`derivative()`	This function computes the monom's derivative.
`boolean`	`equals(Monom m1)`	Check if two monoms are equal.
`double`	`f(double x)`	This function compute the value of the monom.
`double`	`get_coefficient()`	Coefficient getter:
`int`	`get_power()`	Power getter:
`void`	`multiply(Monom ot)`	This function multipy monom by other monom.
`java.lang.String`	`toString()`	This function returns the monom as a string.

- Note : Throughout myMath package Monom is represent by this pattern only a*x^b so that a is a real number and b is a natural number.

Polynom :

Polynom is also a famous mathematical expression. Actually polynom is a sum of couple monoms. Its represented by this structure a1*x^b1+a2*x^b2+…+an*x^bn .

Constructor	Description
`Polynom()`	Empty Constructor - create an empty ArrayList
`Polynom(java.lang.String s)`	String constructor - turn a string into a polynom.
`Polynom(Polynom_able p)`	Copy Constructor - create an identical ArrayList

Modifier and Type	Method	Description
void	`add(Monom m1)`	Add function: This function adds a monom into a polynom.
void	`add(Polynom_able p1)`	Add function: The function going through the polynom p1 (monom by monom) and adds them into the polynom.
double	`area(double x0, double x1, double eps)`	Compute a Riman's integral from x0 to x1 in eps steps.
`Polynom_able`	`copy()`	create a deep copy of this Polynum
`Polynom_able`	`derivative()`	This function computes the polynom's derivative.
boolean	`equals(Polynom_able p1)`	This function checks if two polynoms are equal.
double	`f(double x)`	This function compute the value of the polynom.
boolean	`isZero()`	The function check if the polynom is empty or not.
java.util.Iterator<Monom>	`iteretor()`	Iterator function: Sorts the ArrayList using Monom_Comperator class.
void	`multiply(Polynom_able p1)`	Multiply function: This function going through two polynom (monom by monom) and multiplied them.
double	`root(double x0, double x1, double eps)`	Compute a value x' (x0<=x'<=x1) for with |f(x')| < eps assuming (f(x0)*f(x1)<=0, returns f(x2) such that: * (i) x0<=x2<=x2 && (ii) f(x2)

Test & polyTest :

These classes testing the methods of myMath.

polyTest:

Is a testing unit class which testing(by using eclipse junit) both monom and polynom classes.

Test :

This class demonstrates the functionality of polynom class. It show cases which are possible to compute and invalid cases that the class can't deal with.

drawFunction :

This method printing the graph of the function

0.2*x^4-1.5*x^3+3.0*x^2-1*x^1-5*x^0 , print the maximum and minimum points and compute the area above the function and below X – axis between -2 to 6.