

Polynomial

Method Summary

void	#addPolynomial (polynomial) Adds another polynomial to this polynomial.
void	#addTerm (coefficient, exponent) Adds a term to this polynomial.
Number	#findRoot (startValue, error, iterations) Finds a root of this polynomial using Newton's method, starting from an initial search value, and with a given precision.
Polynomial	#getDerivative () Returns a polynomial that holds the derivative of this polynomial.
Number	#getDerivativeValue (x) Returns the value of the derivative of this polynomial in a certain point.
Number	#getValue (x) Returns the value of this polynomial in a certain point.
void	#multiplyByPolynomial (polynomial) Multiplies this polynomial with another polynomial.
void	#multiplyByTerm (coefficient, exponent) Multiplies this polynomial with a term.
void	#setToZero () Sets this polynomial to zero.

Method Details

[addPolynomial](#)

void **addPolynomial**(polynomial)

Adds another polynomial to this polynomial.

Parameters

polynomial

Returns

void

Sample

```
// (x+1) + 2*(x+1)*x + 3*(x+1)*x^2 + 4*(x+1)*x^3
var eq = plugins.amortization.newPolynomial();
for (var i = 0; i < 4; i++)
{
    var base = plugins.amortization.newPolynomial();
    base.addTerm(1, 1);
    base.addTerm(1, 0);
    base.multiplyByTerm(1, i);
    base.multiplyByTerm(i + 1, 0);
    eq.addPolynomial(base);
}
application.output(eq.getValue(2));
```

[addTerm](#)

void **addTerm**(coefficient, exponent)

Adds a term to this polynomial.

Parameters

coefficient

exponent

Returns

void

Sample

```
// Model the quadratic equation -x^2 + 4x + 0.6 = 0
var eq = plugins.amortization.newPolynomial();
eq.addTerm(-1, 2);
eq.addTerm(4, 1);
eq.addTerm(0.6, 0);
// Find the roots of the equation.
r1 = eq.findRoot(100, 1E-5, 1000);
r2 = eq.findRoot(-100, 1E-5, 1000);
application.output("eq(" + r1 + ")=" + eq.getValue(r1));
application.output("eq(" + r2 + ")=" + eq.getValue(r2));
// Find the minimum/maximum point by zeroing the first derivative.
var deriv = eq.getDerivative();
rd = deriv.findRoot(0, 1E-5, 1000);
application.output("Min/max point: " + rd);
application.output("Min/max value: " + eq.getValue(rd));
if (deriv.getDerivativeValue(rd) < 0) application.output("Max point.");
else application.output("Min point.");
```

findRoot

Number **findRoot**(startValue, error, iterations)

Finds a root of this polynomial using Newton's method, starting from an initial search value, and with a given precision.

Parameters

startValue

error

iterations

Returns

Number

Sample

```
// Model the quadratic equation -x^2 + 4x + 0.6 = 0
var eq = plugins.amortization.newPolynomial();
eq.addTerm(-1, 2);
eq.addTerm(4, 1);
eq.addTerm(0.6, 0);
// Find the roots of the equation.
r1 = eq.findRoot(100, 1E-5, 1000);
r2 = eq.findRoot(-100, 1E-5, 1000);
application.output("eq(" + r1 + ")=" + eq.getValue(r1));
application.output("eq(" + r2 + ")=" + eq.getValue(r2));
// Find the minimum/maximum point by zeroing the first derivative.
var deriv = eq.getDerivative();
rd = deriv.findRoot(0, 1E-5, 1000);
application.output("Min/max point: " + rd);
application.output("Min/max value: " + eq.getValue(rd));
if (deriv.getDerivativeValue(rd) < 0) application.output("Max point.");
else application.output("Min point.");
```

getDerivative

Polynomial **getDerivative**()

Returns a polynomial that holds the derivative of this polynomial.

Returns

Polynomial

Sample

```
// Model the quadratic equation -x^2 + 4x + 0.6 = 0
var eq = plugins.amortization.newPolynomial();
eq.addTerm(-1, 2);
eq.addTerm(4, 1);
eq.addTerm(0.6, 0);
// Find the roots of the equation.
r1 = eq.findRoot(100, 1E-5, 1000);
r2 = eq.findRoot(-100, 1E-5, 1000);
application.output("eq(" + r1 + ")=" + eq.getValue(r1));
application.output("eq(" + r2 + ")=" + eq.getValue(r2));
// Find the minimum/maximum point by zeroing the first derivative.
var deriv = eq.getDerivative();
rd = deriv.findRoot(0, 1E-5, 1000);
application.output("Min/max point: " + rd);
application.output("Min/max value: " + eq.getValue(rd));
if (deriv.getDerivativeValue(rd) < 0) application.output("Max point.");
else application.output("Min point.");
```

`getDerivativeValue`

Number `getDerivativeValue(x)`

Returns the value of the derivative of this polynomial in a certain point.

Parameters

x

Returns

Number

Sample

```
// Model the quadratic equation -x^2 + 4x + 0.6 = 0
var eq = plugins.amortization.newPolynomial();
eq.addTerm(-1, 2);
eq.addTerm(4, 1);
eq.addTerm(0.6, 0);
// Find the roots of the equation.
r1 = eq.findRoot(100, 1E-5, 1000);
r2 = eq.findRoot(-100, 1E-5, 1000);
application.output("eq(" + r1 + ")=" + eq.getValue(r1));
application.output("eq(" + r2 + ")=" + eq.getValue(r2));
// Find the minimum/maximum point by zeroing the first derivative.
var deriv = eq.getDerivative();
rd = deriv.findRoot(0, 1E-5, 1000);
application.output("Min/max point: " + rd);
application.output("Min/max value: " + eq.getValue(rd));
if (deriv.getDerivativeValue(rd) < 0) application.output("Max point.");
else application.output("Min point.");
```

`getValue`

Number `getValue(x)`

Returns the value of this polynomial in a certain point.

Parameters

x

Returns

Number

Sample

```
// Model the quadratic equation -x^2 + 4x + 0.6 = 0
var eq = plugins.amortization.newPolynomial();
eq.addTerm(-1, 2);
eq.addTerm(4, 1);
eq.addTerm(0.6, 0);
// Find the roots of the equation.
r1 = eq.findRoot(100, 1E-5, 1000);
r2 = eq.findRoot(-100, 1E-5, 1000);
application.output("eq(" + r1 + ")=" + eq.getValue(r1));
application.output("eq(" + r2 + ")=" + eq.getValue(r2));
// Find the minimum/maximum point by zeroing the first derivative.
var deriv = eq.getDerivative();
rd = deriv.findRoot(0, 1E-5, 1000);
application.output("Min/max point: " + rd);
application.output("Min/max value: " + eq.getValue(rd));
if (deriv.getDerivativeValue(rd) < 0) application.output("Max point.");
else application.output("Min point.");
```

multiplyByPolynomial

void **multiplyByPolynomial**(polynomial)

Multiplies this polynomial with another polynomial.

Parameters

polynomial

Returns

void

Sample

```
// Model the quadratic equation (x+1)*(x+2) = 0
var eq = plugins.amortization.newPolynomial();
eq.addTerm(1, 1);
eq.addTerm(1, 0);
var eq2 = plugins.amortization.newPolynomial();
eq2.addTerm(1, 1);
eq2.addTerm(2, 0);
eq.multiplyByPolynomial(eq2);
// Find the roots of the equation.
r1 = eq.findRoot(100, 1E-5, 1000);
r2 = eq.findRoot(-100, 1E-5, 1000);
application.output("eq(" + r1 + ")=" + eq.getValue(r1));
application.output("eq(" + r2 + ")=" + eq.getValue(r2));
```

multiplyByTerm

void **multiplyByTerm**(coefficient, exponent)

Multiplies this polynomial with a term.

Parameters

coefficient

exponent

Returns

void

Sample

```
// (x+1) + 2*(x+1)*x + 3*(x+1)*x^2 + 4*(x+1)*x^3
var eq = plugins.amortization.newPolynomial();
for (var i = 0; i < 4; i++)
{
    var base = plugins.amortization.newPolynomial();
    base.addTerm(1, 1);
    base.addTerm(1, 0);
    base.multiplyByTerm(1, i);
    base.multiplyByTerm(i + 1, 0);
    eq.addPolynomial(base);
}
application.output(eq.getValue(2));
```

setToZero

void **setToZero()**

Sets this polynomial to zero.

Returns

void

Sample

```
var eq = plugins.amortization.newPolynomial();
eq.addTerm(2, 3);
application.output(eq.getValue(1.1));
eq.setToZero();
application.output(eq.getValue(1.1));
```