

```
In [194]: if isinstance(yInput, str):
            a, yInput = list(), parse_expr(yInput)
            for xVal in xInput: a.append(N(yInput.subs(x, xVal)))
            yInput = tuple(a)
        n = len(xInput)
        print(n, "points:")
        for i in range(n): print("\tf(", xInput[i], ") = ", yInput[i], sep = "")
        m = [[0 for i in range(n)] for j in range(n)]
        for i in range(n): m[i][0] = yInput[i]
        for j in range(1, n):
            for i in range(n - j):
                m[i][j] = (m[i+1][j-1] - m[i][j-1])/(xInput[i+j] - xInput[i])
        r, a = str(m[0][0]), ""
        for i in range(1, n):
            a += "*" + "(x-" + str(xInput[i - 1]) + ")"
            r += " + " + str(m[0][i]) + a
        print("\nPolynomial", r, sep = "\n")
        print("\nSimplified", simplify(parse_expr(r)), sep = "\n")
```

4 points:

```
f(1) = 0
f(4) = 1.38629436111989
f(6) = 1.79175946922805
f(5) = 1.60943791243410
```

Polynomial

```
0 + 0.462098120373297*(x-1) + -0.0518731132638429*(x-1)*(x-4) + 0.0078655290
0092885*(x-1)*(x-4)*(x-6)
```

Simplified

```
0.00786552900092885*x**3 - 0.13839393227406*x**2 + 0.988891672724092*x - 0.8
58363269450961
```

Run First

```
In [165]: from sympy import *
            x = symbols("x")
```