Given a [polynomial](https://en.wikipedia.org/wiki/Polynomial) over a variable x, your task is to calculate the value of its [derivative](https://en.wikipedia.org/wiki/Derivative) in the given point x.

The polynomial is a combination of several (at least one) monomials. Each monomial is guaranteed to be in the format <coef>\*x^<power>.

* <coef> is an integer in the range [-1000, 1000]. If it is equal to 1, it may be omitted.
* <power> is an integer in the range [0, 12]. If it is equal to 1, it may be omitted. If it is equal to 0, 'x' can also be omitted.

The monomials are separated by a + or a - sign, surrounded by a single whitespace character.

**Example**

For polynomial = "3\*x^2 - x^4 + 8" and x = -2, the output should be  
derivative(polynomial, x) = 20.

The derivative of the polynomial is 6\*x - 4\*x^3. Its value at the point -2 is equal to 6 \* (-2) - 4 \* (-2)3 = -12 - 4 \* (-8) = -12 + 32 = 20. Thus, the answer is 20.

**Input/Output**

* **[time limit] 3000ms (cs)**
* **[input] string polynomial**

A polynomial in the format described above.

* **[input] integer x**

The point at which the derivative should be calculated.

*Guaranteed constraints:*  
-1000 ≤ x ≤ 1000.

* **[output] integer**

The value of the polynomial's derivative at x.

<https://codefights.com/challenge/8wnEp7GjPotzJ7uZq?utm_source=emailNotification&utm_medium=email&utm_campaign=featuredChallenge>

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

namespace ConsoleApplication1

{

class Program

{

static int derivative(string polynomial, int x)

{

string[] partes = polynomial.Split( new string[]{ " + ", " - "}, StringSplitOptions.RemoveEmptyEntries);

//string polynomial = "23\*x^8 + 53\*x - -97\*x^5 -

// -44\*x^2 + 36\*x - 85\*x^3 - -23\*x";

//string polynomial = "-x - -x^2 + 5 - x^3";

//int x = 2;

////Expected Output:

////-9

List<string> terminos = new List<string>();

List<int> terCalc = new List<int>();

string t = "";

// int res = 0;

foreach (string elem in partes)

{

// string[] sp = elem.Split('\*', '/', '^');

string[] sp = elem.Split(new string[] { "\*", "/", "^" }, StringSplitOptions.RemoveEmptyEntries);

int a = 0;

if (sp.Length ==3)

{

if (elem.Contains("^"))

{

a = int.Parse(sp[0]) \* int.Parse(sp[2]);

terCalc.Add(a \* (int)Math.Pow(x, (int.Parse(sp[2]) - 1)));

}

else if (!elem.Contains("^") && elem.Contains("x"))

{

a = int.Parse(sp[0]);

}

else if (!elem.Contains("^") && !elem.Contains("x"))

{

a = int.Parse(sp[0]);

}

}

else if (sp.Length == 2)

{

if (elem.Contains("^"))

{

a = int.Parse(sp[1]);

if (elem[0] == '-')

{

a \*= -1;

}

terCalc.Add(a \* (int)Math.Pow(x, (int.Parse(sp[1]) - 1)));

}

else if (!elem.Contains("^"))

{

a = int.Parse(sp[0]);

terCalc.Add(a);

}

}

else if (sp.Length == 1)

{

if (elem.Contains("-x"))

{

terCalc.Add(-1);

}

else if (elem.Contains("x"))

{

terCalc.Add(1);

}

else if (!elem.Contains("x"))

{

terCalc.Add(0);

}

}

//terminos.Add(t);

Console.WriteLine(t);

}

List<string> signos = new List<string>();

signos.Add("+");

for (int i = 0; i < polynomial.Length; i++)

{

if (polynomial[i] == '+' && i-1>=0 && polynomial[i-1] == ' ' && i+1 <polynomial.Length && polynomial[i+1] == ' ')

{

signos.Add(" + ");

}

else if (polynomial[i] == '-' && i - 1 >= 0 && polynomial[i - 1] == ' ' && i + 1 < polynomial.Length && polynomial[i + 1] == ' ')

{

signos.Add(" - ");

}

}

int index\_signos = 0;

int res = 0;

foreach (int elem in terCalc)

{

// Console.Write(elem + " ");

if (signos[index\_signos] == " - ")

{

res -= elem;

}

else

{

res += elem;

}

index\_signos++;

}

return res;

}

static void Main(string[] args)

{

//string polynomial = "3\*x^2 - x^4 + 8";

//string polynomial = "1000";

//string polynomial= "x";

//int x = 1;

//string polynomial= "x";

//int x = 2;

//string polynomial= "-3\*x^2 + x^3 - 1000";

//int x = -1;

//string polynomial = "23\*x^8 + 53\*x - -97\*x^5 - -44\*x^2 + 36\*x - 85\*x^3 - -23\*x";

//int x = -4; //-2894816

//string polynomial= "3\*x^2 - x^4 + 8";

//int x = -2; //20

//string polynomial = "-x";

//int x = 1;

string polynomial= "-x - -x^2 + 5 - x^3";

int x= 2;

//Expected Output:

//-9

Console.WriteLine( derivative(polynomial, x));

Console.ReadLine();

}

}

}

-------------------SOLUCION POR shouki----------------

int s = 1, a;

int derivative(string p, int x)

{

foreach (var t in p.Split())

{

if (t == "-")

s = -1;

else if (t == "+")

s = 1;

else if (t.Contains('x'))

{

if (t.StartsWith("-x"))

s \*= -1;

int c = t.IndexOf('\*'), e = t.IndexOf('^');

c = c < 0 ? 1 : int.Parse(t.Remove(c));

e = e < 0 ? 1 : int.Parse(t.Substring(e + 1));

a += s \* e-- \* c \* (int)Math.Pow(x, e);

}

}

return a;

}