**Test Case (1):**

8

11 5 6 14 6 -4 11 5 3

-9 -1 2 6 6 0 -13 -8 -3

Expected output:

* Polynomial 1: 3\*x^8 + 5\*x^7 + 11\*x^6 - 4\*x^5 + 6\*x^4 + 14\*x^3 + 6\*x^2 + 5\*x + 11
* Polynomial 2: -3\*x^8 - 8\*x^7 - 13\*x^6 + 6\*x^4 + 6\*x^3 + 2\*x^2 - x - 9
* Sum: -3\*x^7 - 2\*x^6 - 4\*x^5 + 12\*x^4 + 20\*x^3 + 8\*x^2 + 4\*x + 2
* Subtraction: 6\*x^8 + 13\*x^7 + 24\*x^6 - 4\*x^5 + 8\*x^3 + 4\*x^2 + 6\*x + 20
* Product: -9\*x^16 - 39\*x^15 - 112\*x^14 - 141\*x^13 - 111\*x^12 + 10\*x^11 - 106\*x^10 - 196\*x^9 - 149\*x^8 - 97\*x^7 - 106\*x^6 + 124\*x^5 + 40\*x^4 - 56\*x^3 - 37\*x^2 - 56\*x - 99
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 2237
* Derivative: 24\*x^7 + 35\*x^6 + 66\*x^5 - 20\*x^4 + 24\*x^3 + 42\*x^2 + 12\*x + 5
* Integral: x^9/3 + 5\*x^8/8 + 11\*x^7/7 - 2\*x^6/3 + 6\*x^5/5 + 7\*x^4/2 + 2\*x^3 + 5\*x^2/2 + 11\*x
* Definite integration from x=0 to x=1: 18533/840
* Real roots of Polynomial 1: []

**Test Case (2):**

4

1 -13 -8 2 -8

2 -9 1 -1 -13

Expected output:

* Polynomial 1: -8\*x^4 + 2\*x^3 - 8\*x^2 - 13\*x + 1
* Polynomial 2: -13\*x^4 - x^3 + x^2 - 9\*x + 2
* Sum: -21\*x^4 + x^3 - 7\*x^2 - 22\*x + 3
* Subtraction: 5\*x^4 + 3\*x^3 - 9\*x^2 - 4\*x - 1
* Product: 104\*x^8 - 18\*x^7 + 94\*x^6 + 251\*x^5 - 42\*x^4 + 62\*x^3 + 102\*x^2 - 35\*x + 2
* Degree of Polynomial: 4
* Evaluation of polynomial at x=2: -169
* Derivative: -32\*x^3 + 6\*x^2 - 16\*x - 13
* Integral: -8\*x^5/5 + x^4/2 - 8\*x^3/3 - 13\*x^2/2 + x
* Definite integration from x=0 to x=1: -139/15
* Real roots of Polynomial 1: [-0.883044459919991, 0.0736301558194286]

**Test Case (3):**

2

14 -2 7

-14 7 -12

Expected output:

* Polynomial 1: 7\*x^2 - 2\*x + 14
* Polynomial 2: -12\*x^2 + 7\*x - 14
* Sum: -5\*x^2 + 5\*x
* Subtraction: 19\*x^2 - 9\*x + 28
* Product: -84\*x^4 + 73\*x^3 - 280\*x^2 + 126\*x - 196
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 38
* Derivative: 14\*x - 2
* Integral: 7\*x^3/3 - x^2 + 14\*x
* Definite integration from x=0 to x=1: 46/3
* Real roots of Polynomial 1: []

**Test Case (4):**

2

13 5 6

3 -12 11

Expected output:

* Polynomial 1: 6\*x^2 + 5\*x + 13
* Polynomial 2: 11\*x^2 - 12\*x + 3
* Sum: 17\*x^2 - 7\*x + 16
* Subtraction: -5\*x^2 + 17\*x + 10
* Product: 66\*x^4 - 17\*x^3 + 101\*x^2 - 141\*x + 39
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 47
* Derivative: 12\*x + 5
* Integral: 2\*x^3 + 5\*x^2/2 + 13\*x
* Definite integration from x=0 to x=1: 35/2
* Real roots of Polynomial 1: []

**Test Case (5):**

9

-1 -2 8 15 -2 -6 14 12 12 1

15 0 -7 11 -2 14 8 7 -13 -3

Expected output:

* Polynomial 1: x^9 + 12\*x^8 + 12\*x^7 + 14\*x^6 - 6\*x^5 - 2\*x^4 + 15\*x^3 + 8\*x^2 - 2\*x - 1
* Polynomial 2: -3\*x^9 - 13\*x^8 + 7\*x^7 + 8\*x^6 + 14\*x^5 - 2\*x^4 + 11\*x^3 - 7\*x^2 + 15
* Sum: -2\*x^9 - x^8 + 19\*x^7 + 22\*x^6 + 8\*x^5 - 4\*x^4 + 26\*x^3 + x^2 - 2\*x + 14
* Subtraction: 4\*x^9 + 25\*x^8 + 5\*x^7 + 6\*x^6 - 20\*x^5 + 4\*x^3 + 15\*x^2 - 2\*x - 16
* Product: -3\*x^18 - 49\*x^17 - 185\*x^16 - 106\*x^15 + 30\*x^14 + 444\*x^13 + 206\*x^12 + 16\*x^11 - 73\*x^10 + 274\*x^9 + 293\*x^8 + 259\*x^7 + 337\*x^6 - 117\*x^5 - 106\*x^4 + 228\*x^3 + 127\*x^2 - 30\*x - 15
* Degree of Polynomial: 9
* Evaluation of polynomial at x=2: 5939
* Derivative: 9\*x^8 + 96\*x^7 + 84\*x^6 + 84\*x^5 - 30\*x^4 - 8\*x^3 + 45\*x^2 + 16\*x - 2
* Integral: x^10/10 + 4\*x^9/3 + 3\*x^8/2 + 2\*x^7 - x^6 - 2\*x^5/5 + 15\*x^4/4 + 8\*x^3/3 - x^2 - x
* Definite integration from x=0 to x=1: 159/20
* Real roots of Polynomial 1: [-11.0314953036864, -0.327602362497162, 0.361037479450929]

**Test Case (6):**

11

-4 14 -13 -11 12 9 -7 -11 -13 -6 0 5

-8 -12 -12 0 -10 -13 -1 1 4 3 -1 4

Expected output:

* Polynomial 1: 5\*x^11 - 6\*x^9 - 13\*x^8 - 11\*x^7 - 7\*x^6 + 9\*x^5 + 12\*x^4 - 11\*x^3 - 13\*x^2 + 14\*x - 4
* Polynomial 2: 4\*x^11 - x^10 + 3\*x^9 + 4\*x^8 + x^7 - x^6 - 13\*x^5 - 10\*x^4 - 12\*x^2 - 12\*x - 8
* Sum: 9\*x^11 - x^10 - 3\*x^9 - 9\*x^8 - 10\*x^7 - 8\*x^6 - 4\*x^5 + 2\*x^4 - 11\*x^3 - 25\*x^2 + 2\*x - 12
* Subtraction: x^11 + x^10 - 9\*x^9 - 17\*x^8 - 12\*x^7 - 6\*x^6 + 22\*x^5 + 22\*x^4 - 11\*x^3 - x^2 + 26\*x + 4
* Product: 20\*x^22 - 5\*x^21 - 9\*x^20 - 26\*x^19 - 44\*x^18 - 85\*x^17 - 113\*x^16 - 83\*x^15 + 23\*x^14 + 204\*x^13 + 313\*x^12 + 123\*x^11 + 152\*x^10 + 132\*x^9 + 354\*x^8 + 325\*x^7 - 244\*x^6 - 172\*x^5 + 232\*x^4 + 76\*x^3 - 16\*x^2 - 64\*x + 32
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: 2348
* Derivative: 55\*x^10 - 54\*x^8 - 104\*x^7 - 77\*x^6 - 42\*x^5 + 45\*x^4 + 48\*x^3 - 33\*x^2 - 26\*x + 14
* Integral: 5\*x^12/12 - 3\*x^10/5 - 13\*x^9/9 - 11\*x^8/8 - x^7 + 3\*x^6/2 + 12\*x^5/5 - 11\*x^4/4 - 13\*x^3/3 + 7\*x^2 - 4\*x
* Definite integration from x=0 to x=1: -1507/360
* Real roots of Polynomial 1: [1.82167458520084]

**Test Case (7):**

2

-14 9 3

5 -3 13

Expected output:

* Polynomial 1: 3\*x^2 + 9\*x - 14
* Polynomial 2: 13\*x^2 - 3\*x + 5
* Sum: 16\*x^2 + 6\*x - 9
* Subtraction: -10\*x^2 + 12\*x - 19
* Product: 39\*x^4 + 108\*x^3 - 194\*x^2 + 87\*x - 70
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 16
* Derivative: 6\*x + 9
* Integral: x^3 + 9\*x^2/2 - 14\*x
* Definite integration from x=0 to x=1: -17/2
* Real roots of Polynomial 1: [-4.12995563967658, 1.12995563967658]

**Test Case (8):**

11

-4 13 -9 0 5 5 -1 11 4 2 -2 1

9 12 9 -10 3 -11 -14 -13 -9 5 -14 0

Expected output:

* Polynomial 1: x^11 - 2\*x^10 + 2\*x^9 + 4\*x^8 + 11\*x^7 - x^6 + 5\*x^5 + 5\*x^4 - 9\*x^2 + 13\*x - 4
* Polynomial 2: -14\*x^10 + 5\*x^9 - 9\*x^8 - 13\*x^7 - 14\*x^6 - 11\*x^5 + 3\*x^4 - 10\*x^3 + 9\*x^2 + 12\*x + 9
* Sum: x^11 - 16\*x^10 + 7\*x^9 - 5\*x^8 - 2\*x^7 - 15\*x^6 - 6\*x^5 + 8\*x^4 - 10\*x^3 + 25\*x + 5
* Subtraction: x^11 + 12\*x^10 - 3\*x^9 + 13\*x^8 + 24\*x^7 + 13\*x^6 + 16\*x^5 + 2\*x^4 + 10\*x^3 - 18\*x^2 + x - 13
* Product: -14\*x^21 + 33\*x^20 - 47\*x^19 - 41\*x^18 - 140\*x^17 + 24\*x^16 - 229\*x^15 - 273\*x^14 - 170\*x^13 - 105\*x^12 - 355\*x^11 + 6\*x^10 + 115\*x^9 + 117\*x^8 + 51\*x^7 - 18\*x^6 + 278\*x^5 - 178\*x^4 + 49\*x^3 + 39\*x^2 + 69\*x - 36
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: 3618
* Derivative: 11\*x^10 - 20\*x^9 + 18\*x^8 + 32\*x^7 + 77\*x^6 - 6\*x^5 + 25\*x^4 + 20\*x^3 - 18\*x + 13
* Integral: x^12/12 - 2\*x^11/11 + x^10/5 + 4\*x^9/9 + 11\*x^8/8 - x^7/7 + 5\*x^6/6 + x^5 - 3\*x^3 + 13\*x^2/2 - 4\*x
* Definite integration from x=0 to x=1: 86249/27720
* Real roots of Polynomial 1: [0.405457506762619]

**Test Case (9):**

0

-4

-5

Expected output:

* Polynomial 1: -4
* Polynomial 2: -5
* Sum: -9
* Subtraction: 1
* Product: 20
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: -4
* Derivative: 0
* Integral: -4\*x
* Definite integration from x=0 to x=1: -4
* Real roots of Polynomial 1: []

**Test Case (10):**

5

-3 4 -5 -4 8 6 0

-13 -2 -11 -2 -8 7 -7

Expected output:

* Polynomial 1: 6\*x^5 + 8\*x^4 - 4\*x^3 - 5\*x^2 + 4\*x - 3
* Polynomial 2: -7\*x^6 + 7\*x^5 - 8\*x^4 - 2\*x^3 - 11\*x^2 - 2\*x - 13
* Sum: -7\*x^6 + 13\*x^5 - 6\*x^3 - 16\*x^2 + 2\*x - 16
* Subtraction: 7\*x^6 - x^5 + 16\*x^4 - 2\*x^3 + 6\*x^2 + 6\*x + 10
* Product: -42\*x^11 - 14\*x^10 + 36\*x^9 - 69\*x^8 - 113\*x^7 - 3\*x^6 - 93\*x^5 - 25\*x^4 + 24\*x^3 + 90\*x^2 - 46\*x + 39
* Degree of Polynomial: 5
* Evaluation of polynomial at x=2: 273
* Derivative: 30\*x^4 + 32\*x^3 - 12\*x^2 - 10\*x + 4
* Integral: x^6 + 8\*x^5/5 - x^4 - 5\*x^3/3 + 2\*x^2 - 3\*x
* Definite integration from x=0 to x=1: -16/15
* Real roots of Polynomial 1: [0.788149812717564]

**Test Case (11):**

8

4 -7 15 4 -13 0 -5 9 -14

-4 15 10 -14 -14 8 -3 3 -8

Expected output:

* Polynomial 1: -14\*x^8 + 9\*x^7 - 5\*x^6 - 13\*x^4 + 4\*x^3 + 15\*x^2 - 7\*x + 4
* Polynomial 2: -8\*x^8 + 3\*x^7 - 3\*x^6 + 8\*x^5 - 14\*x^4 - 14\*x^3 + 10\*x^2 + 15\*x - 4
* Sum: -22\*x^8 + 12\*x^7 - 8\*x^6 + 8\*x^5 - 27\*x^4 - 10\*x^3 + 25\*x^2 + 8\*x
* Subtraction: -6\*x^8 + 6\*x^7 - 2\*x^6 - 8\*x^5 + x^4 + 18\*x^3 + 5\*x^2 - 22\*x + 8
* Product: 112\*x^16 - 114\*x^15 + 109\*x^14 - 154\*x^13 + 387\*x^12 - 41\*x^11 - 265\*x^10 - 65\*x^9 + 257\*x^8 + 168\*x^7 - 444\*x^6 - 235\*x^5 + 304\*x^4 + 83\*x^3 - 125\*x^2 + 88\*x - 16
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: -2878
* Derivative: -112\*x^7 + 63\*x^6 - 30\*x^5 - 52\*x^3 + 12\*x^2 + 30\*x - 7
* Integral: -14\*x^9/9 + 9\*x^8/8 - 5\*x^7/7 - 13\*x^5/5 + x^4 + 5\*x^3 - 7\*x^2/2 + 4\*x
* Definite integration from x=0 to x=1: 6943/2520
* Real roots of Polynomial 1: [-0.882126910168783, 0.896865407596683]

**Test Case (12):**

0

5

1

Expected output:

* Polynomial 1: 5
* Polynomial 2: 1
* Sum: 6
* Subtraction: 4
* Product: 5
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: 5
* Derivative: 0
* Integral: 5\*x
* Definite integration from x=0 to x=1: 5
* Real roots of Polynomial 1: []

**Test Case (13):**

10

0 -8 13 -1 -13 5 15 -6 -13 -13 15

3 10 -9 -5 0 -5 -8 11 -5 0 6

Expected output:

* Polynomial 1: 15\*x^10 - 13\*x^9 - 13\*x^8 - 6\*x^7 + 15\*x^6 + 5\*x^5 - 13\*x^4 - x^3 + 13\*x^2 - 8\*x
* Polynomial 2: 6\*x^10 - 5\*x^8 + 11\*x^7 - 8\*x^6 - 5\*x^5 - 5\*x^3 - 9\*x^2 + 10\*x + 3
* Sum: 21\*x^10 - 13\*x^9 - 18\*x^8 + 5\*x^7 + 7\*x^6 - 13\*x^4 - 6\*x^3 + 4\*x^2 + 2\*x + 3
* Subtraction: 9\*x^10 - 13\*x^9 - 8\*x^8 - 17\*x^7 + 23\*x^6 + 10\*x^5 - 13\*x^4 + 4\*x^3 + 22\*x^2 - 18\*x - 3
* Product: 90\*x^20 - 78\*x^19 - 153\*x^18 + 194\*x^17 - 108\*x^16 - 54\*x^15 - 50\*x^14 + 172\*x^13 + 38\*x^12 + 31\*x^11 + 65\*x^10 + 66\*x^9 - 446\*x^8 + 151\*x^7 + 257\*x^6 - 171\*x^5 - 126\*x^4 + 199\*x^3 - 41\*x^2 - 24\*x
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: 5548
* Derivative: 150\*x^9 - 117\*x^8 - 104\*x^7 - 42\*x^6 + 90\*x^5 + 25\*x^4 - 52\*x^3 - 3\*x^2 + 26\*x - 8
* Integral: 15\*x^11/11 - 13\*x^10/10 - 13\*x^9/9 - 3\*x^8/4 + 15\*x^7/7 + 5\*x^6/6 - 13\*x^5/5 - x^4/4 + 13\*x^3/3 - 4\*x^2
* Definite integration from x=0 to x=1: -5791/3465
* Real roots of Polynomial 1: [0, 1.36622405076568]

**Test Case (14):**

2

-2 10 -14

-6 5 -1

Expected output:

* Polynomial 1: -14\*x^2 + 10\*x - 2
* Polynomial 2: -x^2 + 5\*x - 6
* Sum: -15\*x^2 + 15\*x - 8
* Subtraction: -13\*x^2 + 5\*x + 4
* Product: 14\*x^4 - 80\*x^3 + 136\*x^2 - 70\*x + 12
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: -38
* Derivative: 10 - 28\*x
* Integral: -14\*x^3/3 + 5\*x^2 - 2\*x
* Definite integration from x=0 to x=1: -5/3
* Real roots of Polynomial 1: []

**Test Case (15):**

0

-5

-3

Expected output:

* Polynomial 1: -5
* Polynomial 2: -3
* Sum: -8
* Subtraction: -2
* Product: 15
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: -5
* Derivative: 0
* Integral: -5\*x
* Definite integration from x=0 to x=1: -5
* Real roots of Polynomial 1: []

**Test Case (16):**

11

-6 -4 -7 5 -8 -3 -10 12 -5 1 0 15

1 10 1 5 -5 3 5 8 -3 14 5 6

Expected output:

* Polynomial 1: 15\*x^11 + x^9 - 5\*x^8 + 12\*x^7 - 10\*x^6 - 3\*x^5 - 8\*x^4 + 5\*x^3 - 7\*x^2 - 4\*x - 6
* Polynomial 2: 6\*x^11 + 5\*x^10 + 14\*x^9 - 3\*x^8 + 8\*x^7 + 5\*x^6 + 3\*x^5 - 5\*x^4 + 5\*x^3 + x^2 + 10\*x + 1
* Sum: 21\*x^11 + 5\*x^10 + 15\*x^9 - 8\*x^8 + 20\*x^7 - 5\*x^6 - 13\*x^4 + 10\*x^3 - 6\*x^2 + 6\*x - 5
* Subtraction: 9\*x^11 - 5\*x^10 - 13\*x^9 - 2\*x^8 + 4\*x^7 - 15\*x^6 - 6\*x^5 - 3\*x^4 - 8\*x^2 - 14\*x - 7
* Product: 90\*x^22 + 75\*x^21 + 216\*x^20 - 70\*x^19 + 181\*x^18 + 2\*x^17 + 168\*x^16 - 349\*x^15 + 127\*x^14 - 145\*x^13 + 177\*x^12 - 347\*x^11 + 41\*x^10 - 199\*x^9 + 96\*x^8 - 245\*x^7 - 30\*x^6 - 111\*x^5 + 45\*x^4 - 99\*x^3 - 53\*x^2 - 64\*x - 6
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: 30622
* Derivative: 165\*x^10 + 9\*x^8 - 40\*x^7 + 84\*x^6 - 60\*x^5 - 15\*x^4 - 32\*x^3 + 15\*x^2 - 14\*x - 4
* Integral: 5\*x^12/4 + x^10/10 - 5\*x^9/9 + 3\*x^8/2 - 10\*x^7/7 - x^6/2 - 8\*x^5/5 + 5\*x^4/4 - 7\*x^3/3 - 2\*x^2 - 6\*x
* Definite integration from x=0 to x=1: -650/63
* Real roots of Polynomial 1: [1.06091677387154]

**Test Case (17):**

6

3 -2 10 5 -2 -8 3

11 4 -10 10 13 -8 -6

Expected output:

* Polynomial 1: 3\*x^6 - 8\*x^5 - 2\*x^4 + 5\*x^3 + 10\*x^2 - 2\*x + 3
* Polynomial 2: -6\*x^6 - 8\*x^5 + 13\*x^4 + 10\*x^3 - 10\*x^2 + 4\*x + 11
* Sum: -3\*x^6 - 16\*x^5 + 11\*x^4 + 15\*x^3 + 2\*x + 14
* Subtraction: 9\*x^6 - 15\*x^4 - 5\*x^3 + 20\*x^2 - 6\*x - 8
* Product: -18\*x^12 + 24\*x^11 + 115\*x^10 - 88\*x^9 - 236\*x^8 + 69\*x^7 + 199\*x^6 - 96\*x^5 - 83\*x^4 + 145\*x^3 + 72\*x^2 - 10\*x + 33
* Degree of Polynomial: 6
* Evaluation of polynomial at x=2: -17
* Derivative: 18\*x^5 - 40\*x^4 - 8\*x^3 + 15\*x^2 + 20\*x - 2
* Integral: 3\*x^7/7 - 4\*x^6/3 - 2\*x^5/5 + 5\*x^4/4 + 10\*x^3/3 - x^2 + 3\*x
* Definite integration from x=0 to x=1: 739/140
* Real roots of Polynomial 1: [1.57895069098063, 2.43626046561862]

**Test Case (18):**

0

-1

-4

Expected output:

* Polynomial 1: -1
* Polynomial 2: -4
* Sum: -5
* Subtraction: 3
* Product: 4
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: -1
* Derivative: 0
* Integral: -x
* Definite integration from x=0 to x=1: -1
* Real roots of Polynomial 1: []

**Test Case (19):**

8

-9 13 -11 -6 -2 -3 11 -7 10

4 -1 10 14 3 15 -7 -10 0

Expected output:

* Polynomial 1: 10\*x^8 - 7\*x^7 + 11\*x^6 - 3\*x^5 - 2\*x^4 - 6\*x^3 - 11\*x^2 + 13\*x - 9
* Polynomial 2: -10\*x^7 - 7\*x^6 + 15\*x^5 + 3\*x^4 + 14\*x^3 + 10\*x^2 - x + 4
* Sum: 10\*x^8 - 17\*x^7 + 4\*x^6 + 12\*x^5 + x^4 + 8\*x^3 - x^2 + 12\*x - 5
* Subtraction: 10\*x^8 + 3\*x^7 + 18\*x^6 - 18\*x^5 - 5\*x^4 - 20\*x^3 - 21\*x^2 + 14\*x - 13
* Product: -100\*x^15 + 89\*x^13 - 122\*x^12 + 325\*x^11 + 64\*x^10 + 187\*x^9 - 34\*x^8 - 281\*x^7 + 168\*x^6 - 320\*x^5 + 43\*x^4 - 9\*x^3 - 147\*x^2 + 61\*x - 36
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 2165
* Derivative: 80\*x^7 - 49\*x^6 + 66\*x^5 - 15\*x^4 - 8\*x^3 - 18\*x^2 - 22\*x + 13
* Integral: 10\*x^9/9 - 7\*x^8/8 + 11\*x^7/7 - x^6/2 - 2\*x^5/5 - 3\*x^4/2 - 11\*x^3/3 + 13\*x^2/2 - 9\*x
* Definite integration from x=0 to x=1: -17033/2520
* Real roots of Polynomial 1: [-0.988777065047935, 1.06306426671716]

**Test Case (20):**

10

-5 6 -9 -14 4 15 -3 14 7 -9 4

11 -14 7 0 -12 12 1 5 -12 0 -4

Expected output:

* Polynomial 1: 4\*x^10 - 9\*x^9 + 7\*x^8 + 14\*x^7 - 3\*x^6 + 15\*x^5 + 4\*x^4 - 14\*x^3 - 9\*x^2 + 6\*x - 5
* Polynomial 2: -4\*x^10 - 12\*x^8 + 5\*x^7 + x^6 + 12\*x^5 - 12\*x^4 + 7\*x^2 - 14\*x + 11
* Sum: -9\*x^9 - 5\*x^8 + 19\*x^7 - 2\*x^6 + 27\*x^5 - 8\*x^4 - 14\*x^3 - 2\*x^2 - 8\*x + 6
* Subtraction: 8\*x^10 - 9\*x^9 + 19\*x^8 + 9\*x^7 - 4\*x^6 + 3\*x^5 + 16\*x^4 - 14\*x^3 - 16\*x^2 + 20\*x - 16
* Product: -16\*x^20 + 36\*x^19 - 76\*x^18 + 72\*x^17 - 113\*x^16 - 154\*x^15 - 59\*x^14 + 67\*x^13 + 172\*x^12 - 144\*x^11 + 497\*x^10 - 362\*x^9 - 275\*x^8 + 342\*x^7 - 40\*x^6 - 121\*x^5 + 237\*x^4 + 14\*x^3 - 218\*x^2 + 136\*x - 55
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: 3283
* Derivative: 40\*x^9 - 81\*x^8 + 56\*x^7 + 98\*x^6 - 18\*x^5 + 75\*x^4 + 16\*x^3 - 42\*x^2 - 18\*x + 6
* Integral: 4\*x^11/11 - 9\*x^10/10 + 7\*x^9/9 + 7\*x^8/4 - 3\*x^7/7 + 5\*x^6/2 + 4\*x^5/5 - 7\*x^4/2 - 3\*x^3 + 3\*x^2 - 5\*x
* Definite integration from x=0 to x=1: -50411/13860
* Real roots of Polynomial 1: [-1.15304245791614, 0.893604740250586]

**Test Case (21):**

8

-6 -9 -6 -12 10 1 1 -10 12

-6 -1 12 8 -6 -1 2 3 -2

Expected output:

* Polynomial 1: 12\*x^8 - 10\*x^7 + x^6 + x^5 + 10\*x^4 - 12\*x^3 - 6\*x^2 - 9\*x - 6
* Polynomial 2: -2\*x^8 + 3\*x^7 + 2\*x^6 - x^5 - 6\*x^4 + 8\*x^3 + 12\*x^2 - x - 6
* Sum: 10\*x^8 - 7\*x^7 + 3\*x^6 + 4\*x^4 - 4\*x^3 + 6\*x^2 - 10\*x - 12
* Subtraction: 14\*x^8 - 13\*x^7 - x^6 + 2\*x^5 + 16\*x^4 - 20\*x^3 - 18\*x^2 - 8\*x
* Product: -24\*x^16 + 56\*x^15 - 8\*x^14 - 31\*x^13 - 77\*x^12 + 211\*x^11 + 53\*x^10 - 164\*x^9 - 117\*x^8 + 193\*x^7 + 50\*x^6 - 148\*x^5 - 156\*x^4 - 78\*x^3 - 27\*x^2 + 60\*x + 36
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 1904
* Derivative: 96\*x^7 - 70\*x^6 + 6\*x^5 + 5\*x^4 + 40\*x^3 - 36\*x^2 - 12\*x - 9
* Integral: 4\*x^9/3 - 5\*x^8/4 + x^7/7 + x^6/6 + 2\*x^5 - 3\*x^4 - 2\*x^3 - 9\*x^2/2 - 6\*x
* Definite integration from x=0 to x=1: -367/28
* Real roots of Polynomial 1: [-0.537744083489190, 1.22486741596371]

**Test Case (22):**

4

8 -6 14 -8 8

-9 -3 -11 3 8

Expected output:

* Polynomial 1: 8\*x^4 - 8\*x^3 + 14\*x^2 - 6\*x + 8
* Polynomial 2: 8\*x^4 + 3\*x^3 - 11\*x^2 - 3\*x - 9
* Sum: 16\*x^4 - 5\*x^3 + 3\*x^2 - 9\*x - 1
* Subtraction: -11\*x^3 + 25\*x^2 - 3\*x + 17
* Product: 64\*x^8 - 40\*x^7 + 58\*x^5 - 156\*x^4 + 120\*x^3 - 196\*x^2 + 30\*x - 72
* Degree of Polynomial: 4
* Evaluation of polynomial at x=2: 116
* Derivative: 32\*x^3 - 24\*x^2 + 28\*x - 6
* Integral: 8\*x^5/5 - 2\*x^4 + 14\*x^3/3 - 3\*x^2 + 8\*x
* Definite integration from x=0 to x=1: 139/15
* Real roots of Polynomial 1: []

**Test Case (23):**

8

-10 -9 10 -8 5 -10 -7 8 7

-10 10 10 12 12 1 13 0 8

Expected output:

* Polynomial 1: 7\*x^8 + 8\*x^7 - 7\*x^6 - 10\*x^5 + 5\*x^4 - 8\*x^3 + 10\*x^2 - 9\*x - 10
* Polynomial 2: 8\*x^8 + 13\*x^6 + x^5 + 12\*x^4 + 12\*x^3 + 10\*x^2 + 10\*x - 10
* Sum: 15\*x^8 + 8\*x^7 + 6\*x^6 - 9\*x^5 + 17\*x^4 + 4\*x^3 + 20\*x^2 + x - 20
* Subtraction: -x^8 + 8\*x^7 - 20\*x^6 - 11\*x^5 - 7\*x^4 - 20\*x^3 - 19\*x
* Product: 56\*x^16 + 64\*x^15 + 35\*x^14 + 31\*x^13 + 41\*x^12 - 21\*x^11 + 217\*x^10 - 225\*x^9 - 78\*x^8 - 393\*x^7 - 95\*x^6 + 72\*x^5 - 258\*x^4 - 30\*x^3 - 290\*x^2 - 10\*x + 100
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 2076
* Derivative: 56\*x^7 + 56\*x^6 - 42\*x^5 - 50\*x^4 + 20\*x^3 - 24\*x^2 + 20\*x - 9
* Integral: 7\*x^9/9 + x^8 - x^7 - 5\*x^6/3 + x^5 - 2\*x^4 + 10\*x^3/3 - 9\*x^2/2 - 10\*x
* Definite integration from x=0 to x=1: -235/18
* Real roots of Polynomial 1: [-0.549694806517935, 1.18082765235947]

**Test Case (24):**

11

12 2 8 4 2 2 -2 3 -6 -11 14 13

-12 -14 11 -13 11 -8 1 -12 -5 10 -2 1

Expected output:

* Polynomial 1: 13\*x^11 + 14\*x^10 - 11\*x^9 - 6\*x^8 + 3\*x^7 - 2\*x^6 + 2\*x^5 + 2\*x^4 + 4\*x^3 + 8\*x^2 + 2\*x + 12
* Polynomial 2: x^11 - 2\*x^10 + 10\*x^9 - 5\*x^8 - 12\*x^7 + x^6 - 8\*x^5 + 11\*x^4 - 13\*x^3 + 11\*x^2 - 14\*x - 12
* Sum: 14\*x^11 + 12\*x^10 - x^9 - 11\*x^8 - 9\*x^7 - x^6 - 6\*x^5 + 13\*x^4 - 9\*x^3 + 19\*x^2 - 12\*x
* Subtraction: 12\*x^11 + 16\*x^10 - 21\*x^9 - x^8 + 15\*x^7 - 3\*x^6 + 10\*x^5 - 9\*x^4 + 17\*x^3 - 3\*x^2 + 16\*x + 24
* Product: 13\*x^22 - 12\*x^21 + 91\*x^20 + 91\*x^19 - 321\*x^18 - 168\*x^17 + 108\*x^16 + 55\*x^15 + 61\*x^14 - 75\*x^13 + 15\*x^12 - 300\*x^11 - 247\*x^10 + 299\*x^9 - 104\*x^8 - 174\*x^7 + 50\*x^6 - 186\*x^5 + 114\*x^4 - 294\*x^3 + 8\*x^2 - 192\*x - 144
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: 34224
* Derivative: 143\*x^10 + 140\*x^9 - 99\*x^8 - 48\*x^7 + 21\*x^6 - 12\*x^5 + 10\*x^4 + 8\*x^3 + 12\*x^2 + 16\*x + 2
* Integral: 13\*x^12/12 + 14\*x^11/11 - 11\*x^10/10 - 2\*x^9/3 + 3\*x^8/8 - 2\*x^7/7 + x^6/3 + 2\*x^5/5 + x^4 + 8\*x^3/3 + x^2 + 12\*x
* Definite integration from x=0 to x=1: 167047/9240
* Real roots of Polynomial 1: [-1.35456091922368]

**Test Case (25):**

9

-2 3 -8 -10 -6 -6 -9 -9 12 -9

-4 8 7 15 -10 2 -7 6 -14 11

Expected output:

* Polynomial 1: -9\*x^9 + 12\*x^8 - 9\*x^7 - 9\*x^6 - 6\*x^5 - 6\*x^4 - 10\*x^3 - 8\*x^2 + 3\*x - 2
* Polynomial 2: 11\*x^9 - 14\*x^8 + 6\*x^7 - 7\*x^6 + 2\*x^5 - 10\*x^4 + 15\*x^3 + 7\*x^2 + 8\*x - 4
* Sum: 2\*x^9 - 2\*x^8 - 3\*x^7 - 16\*x^6 - 4\*x^5 - 16\*x^4 + 5\*x^3 - x^2 + 11\*x - 6
* Subtraction: -20\*x^9 + 26\*x^8 - 15\*x^7 - 2\*x^6 - 8\*x^5 + 4\*x^4 - 25\*x^3 - 15\*x^2 - 5\*x + 2
* Product: -99\*x^18 + 258\*x^17 - 321\*x^16 + 162\*x^15 - 96\*x^14 + 141\*x^13 - 272\*x^12 + 247\*x^11 + 82\*x^10 - 60\*x^9 - 131\*x^8 - 117\*x^7 - 104\*x^6 - 248\*x^5 - 47\*x^4 - 33\*x^3 + 42\*x^2 - 28\*x + 8
* Degree of Polynomial: 9
* Evaluation of polynomial at x=2: -3660
* Derivative: -81\*x^8 + 96\*x^7 - 63\*x^6 - 54\*x^5 - 30\*x^4 - 24\*x^3 - 30\*x^2 - 16\*x + 3
* Integral: -9\*x^10/10 + 4\*x^9/3 - 9\*x^8/8 - 9\*x^7/7 - x^6 - 6\*x^5/5 - 5\*x^4/2 - 8\*x^3/3 + 3\*x^2/2 - 2\*x
* Definite integration from x=0 to x=1: -8269/840
* Real roots of Polynomial 1: [-0.846767699204863]

**Test Case (26):**

7

-1 -4 6 -8 -2 10 6 9

-14 -7 4 7 -10 8 0 15

Expected output:

* Polynomial 1: 9\*x^7 + 6\*x^6 + 10\*x^5 - 2\*x^4 - 8\*x^3 + 6\*x^2 - 4\*x - 1
* Polynomial 2: 15\*x^7 + 8\*x^5 - 10\*x^4 + 7\*x^3 + 4\*x^2 - 7\*x - 14
* Sum: 24\*x^7 + 6\*x^6 + 18\*x^5 - 12\*x^4 - x^3 + 10\*x^2 - 11\*x - 15
* Subtraction: -6\*x^7 + 6\*x^6 + 2\*x^5 + 8\*x^4 - 15\*x^3 + 2\*x^2 + 3\*x + 13
* Product: 135\*x^14 + 90\*x^13 + 222\*x^12 - 72\*x^11 - 37\*x^10 + 52\*x^9 - 73\*x^8 - 29\*x^7 - 310\*x^6 - 84\*x^5 + 90\*x^4 + 47\*x^3 - 60\*x^2 + 63\*x + 14
* Degree of Polynomial: 7
* Evaluation of polynomial at x=2: 1775
* Derivative: 63\*x^6 + 36\*x^5 + 50\*x^4 - 8\*x^3 - 24\*x^2 + 12\*x - 4
* Integral: 9\*x^8/8 + 6\*x^7/7 + 5\*x^6/3 - 2\*x^5/5 - 2\*x^4 + 2\*x^3 - 2\*x^2 - x
* Definite integration from x=0 to x=1: 209/840
* Real roots of Polynomial 1: [-1.03819717707786, -0.186199186330593, 0.749600188448983]

**Test Case (27):**

0

-9

12

Expected output:

* Polynomial 1: -9
* Polynomial 2: 12
* Sum: 3
* Subtraction: -21
* Product: -108
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: -9
* Derivative: 0
* Integral: -9\*x
* Definite integration from x=0 to x=1: -9
* Real roots of Polynomial 1: []

**Test Case (28):**

10

-1 -10 10 -1 2 -3 13 5 -4 13 13

4 12 7 12 3 3 -8 -1 7 9 12

**Expected output:**

* Polynomial 1: 13\*x^10 + 13\*x^9 - 4\*x^8 + 5\*x^7 + 13\*x^6 - 3\*x^5 + 2\*x^4 - x^3 + 10\*x^2 - 10\*x - 1
* Polynomial 2: 12\*x^10 + 9\*x^9 + 7\*x^8 - x^7 - 8\*x^6 + 3\*x^5 + 3\*x^4 + 12\*x^3 + 7\*x^2 + 12\*x + 4
* Sum: 25\*x^10 + 22\*x^9 + 3\*x^8 + 4\*x^7 + 5\*x^6 + 5\*x^4 + 11\*x^3 + 17\*x^2 + 2\*x + 3
* Subtraction: x^10 + 4\*x^9 - 11\*x^8 + 6\*x^7 + 21\*x^6 - 6\*x^5 - x^4 - 13\*x^3 + 3\*x^2 - 22\*x - 5
* Product: 156\*x^20 + 273\*x^19 + 160\*x^18 + 102\*x^17 + 56\*x^16 + 55\*x^15 + 193\*x^14 + 115\*x^13 + 274\*x^12 + 238\*x^11 + 223\*x^10 + 111\*x^9 + 25\*x^8 + 287\*x^7 + 26\*x^6 + 92\*x^5 - 57\*x^4 + 34\*x^3 - 87\*x^2 - 52\*x - 4
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: 20363
* Derivative: 130\*x^9 + 117\*x^8 - 32\*x^7 + 35\*x^6 + 78\*x^5 - 15\*x^4 + 8\*x^3 - 3\*x^2 + 20\*x - 10
* Integral: 13\*x^11/11 + 13\*x^10/10 - 4\*x^9/9 + 5\*x^8/8 + 13\*x^7/7 - x^6/2 + 2\*x^5/5 - x^4/4 + 10\*x^3/3 - 5\*x^2 - x
* Definite integration from x=0 to x=1: 41659/27720
* Real roots of Polynomial 1: [-0.0915290543036897, 0.727055676529518]

**Test Case (29):**

1

-5 15

8 0

Expected output:

* Polynomial 1: 15\*x - 5
* Polynomial 2: 8
* Sum: 15\*x + 3
* Subtraction: 15\*x - 13
* Product: 120\*x - 40
* Degree of Polynomial: 1
* Evaluation of polynomial at x=2: 25
* Derivative: 15
* Integral: 15\*x^2/2 - 5\*x
* Definite integration from x=0 to x=1: 5/2
* Real roots of Polynomial 1: [0.333333333333333]

**Test Case (30):**

6

-14 6 6 5 9 6 8

-11 -9 13 -4 8 -8 12

Expected output:

* Polynomial 1: 8\*x^6 + 6\*x^5 + 9\*x^4 + 5\*x^3 + 6\*x^2 + 6\*x - 14
* Polynomial 2: 12\*x^6 - 8\*x^5 + 8\*x^4 - 4\*x^3 + 13\*x^2 - 9\*x - 11
* Sum: 20\*x^6 - 2\*x^5 + 17\*x^4 + x^3 + 19\*x^2 - 3\*x - 25
* Subtraction: -4\*x^6 + 14\*x^5 + x^4 + 9\*x^3 - 7\*x^2 + 15\*x - 3
* Product: 96\*x^12 + 8\*x^11 + 124\*x^10 + 4\*x^9 + 184\*x^8 + 34\*x^7 - 213\*x^6 + 54\*x^5 - 202\*x^4 + 25\*x^3 - 302\*x^2 + 60\*x + 154
* Degree of Polynomial: 6
* Evaluation of polynomial at x=2: 910
* Derivative: 48\*x^5 + 30\*x^4 + 36\*x^3 + 15\*x^2 + 12\*x + 6
* Integral: 8\*x^7/7 + x^6 + 9\*x^5/5 + 5\*x^4/4 + 2\*x^3 + 3\*x^2 - 14\*x
* Definite integration from x=0 to x=1: -533/140
* Real roots of Polynomial 1: [-1.13072279569630, 0.720173803626486]

**Test Case (31):**

2

-14 -2 -8

10 2 -8

Expected output:

* Polynomial 1: -8\*x^2 - 2\*x - 14
* Polynomial 2: -8\*x^2 + 2\*x + 10
* Sum: -16\*x^2 - 4
* Subtraction: -4\*x - 24
* Product: 64\*x^4 + 28\*x^2 - 48\*x - 140
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: -50
* Derivative: -16\*x - 2
* Integral: -8\*x^3/3 - x^2 - 14\*x
* Definite integration from x=0 to x=1: -53/3
* Real roots of Polynomial 1: []

**Test Case (32):**

7

-13 9 8 -12 14 3 -1 1

-5 -6 15 -3 15 -1 1 -1

Expected output:

* Polynomial 1: x^7 - x^6 + 3\*x^5 + 14\*x^4 - 12\*x^3 + 8\*x^2 + 9\*x - 13
* Polynomial 2: -x^7 + x^6 - x^5 + 15\*x^4 - 3\*x^3 + 15\*x^2 - 6\*x - 5
* Sum: 2\*x^5 + 29\*x^4 - 15\*x^3 + 23\*x^2 + 3\*x - 18
* Subtraction: 2\*x^7 - 2\*x^6 + 4\*x^5 - x^4 - 9\*x^3 - 7\*x^2 + 15\*x - 8
* Product: -x^14 + 2\*x^13 - 5\*x^12 + 5\*x^11 + 5\*x^10 + 29\*x^9 + 191\*x^8 - 162\*x^7 + 331\*x^6 - 155\*x^5 - 100\*x^4 + 186\*x^3 - 289\*x^2 + 33\*x + 65
* Degree of Polynomial: 7
* Evaluation of polynomial at x=2: 325
* Derivative: 7\*x^6 - 6\*x^5 + 15\*x^4 + 56\*x^3 - 36\*x^2 + 16\*x + 9
* Integral: x^8/8 - x^7/7 + x^6/2 + 14\*x^5/5 - 3\*x^4 + 8\*x^3/3 + 9\*x^2/2 - 13\*x
* Definite integration from x=0 to x=1: -4663/840
* Real roots of Polynomial 1: [-2.09626305059082, -0.890774340931132, 0.804720881885316]

**Test Case (33):**

2

1 9 -14

-11 -8 9

Expected output:

* Polynomial 1: -14\*x^2 + 9\*x + 1
* Polynomial 2: 9\*x^2 - 8\*x - 11
* Sum: -5\*x^2 + x - 10
* Subtraction: -23\*x^2 + 17\*x + 12
* Product: -126\*x^4 + 193\*x^3 + 91\*x^2 - 107\*x - 11
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: -37
* Derivative: 9 - 28\*x
* Integral: -14\*x^3/3 + 9\*x^2/2 + x
* Definite integration from x=0 to x=1: 5/6
* Real roots of Polynomial 1: [-0.0965964253828438, 0.739453568239987]

**Test Case (34):**

2

-6 -13 -8

3 13 7

Expected output:

* Polynomial 1: -8\*x^2 - 13\*x - 6
* Polynomial 2: 7\*x^2 + 13\*x + 3
* Sum: -x^2 - 3
* Subtraction: -15\*x^2 - 26\*x - 9
* Product: -56\*x^4 - 195\*x^3 - 235\*x^2 - 117\*x - 18
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: -64
* Derivative: -16\*x - 13
* Integral: -8\*x^3/3 - 13\*x^2/2 - 6\*x
* Definite integration from x=0 to x=1: -91/6
* Real roots of Polynomial 1: []

**Test Case (35):**

2

-14 -11 11

-14 4 -10

Expected output:

* Polynomial 1: 11\*x^2 - 11\*x - 14
* Polynomial 2: -10\*x^2 + 4\*x - 14
* Sum: x^2 - 7\*x - 28
* Subtraction: 21\*x^2 - 15\*x
* Product: -110\*x^4 + 154\*x^3 - 58\*x^2 + 98\*x + 196
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 8
* Derivative: 22\*x - 11
* Integral: 11\*x^3/3 - 11\*x^2/2 - 14\*x
* Definite integration from x=0 to x=1: -95/6
* Real roots of Polynomial 1: [-0.733988360045293, 1.73398836004529]

**Test Case (36):**

10

6 5 11 4 0 13 -6 -8 -7 -5 -8

0 11 8 -4 13 13 10 7 -9 15 5

Expected output:

* Polynomial 1: -8\*x^10 - 5\*x^9 - 7\*x^8 - 8\*x^7 - 6\*x^6 + 13\*x^5 + 4\*x^3 + 11\*x^2 + 5\*x + 6
* Polynomial 2: 5\*x^10 + 15\*x^9 - 9\*x^8 + 7\*x^7 + 10\*x^6 + 13\*x^5 + 13\*x^4 - 4\*x^3 + 8\*x^2 + 11\*x
* Sum: -3\*x^10 + 10\*x^9 - 16\*x^8 - x^7 + 4\*x^6 + 26\*x^5 + 13\*x^4 + 19\*x^2 + 16\*x + 6
* Subtraction: -13\*x^10 - 20\*x^9 + 2\*x^8 - 15\*x^7 - 16\*x^6 - 13\*x^4 + 8\*x^3 + 3\*x^2 - 6\*x + 6
* Product: -40\*x^20 - 145\*x^19 - 38\*x^18 - 156\*x^17 - 202\*x^16 - 156\*x^15 - 46\*x^14 - 343\*x^13 - 93\*x^12 + 2\*x^11 + 46\*x^10 + 214\*x^9 - 45\*x^8 + 325\*x^7 + 395\*x^6 + 131\*x^5 + 190\*x^4 + 137\*x^3 + 103\*x^2 + 66\*x
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: -13444
* Derivative: -80\*x^9 - 45\*x^8 - 56\*x^7 - 56\*x^6 - 36\*x^5 + 65\*x^4 + 12\*x^2 + 22\*x + 5
* Integral: -8\*x^11/11 - x^10/2 - 7\*x^9/9 - x^8 - 6\*x^7/7 + 13\*x^6/6 + x^4 + 11\*x^3/3 + 5\*x^2/2 + 6\*x
* Definite integration from x=0 to x=1: 15899/1386
* Real roots of Polynomial 1: [-0.838058898380274, 1.02600094936019]

**Test Case (37):**

8

15 -8 3 -7 -7 -4 -6 4 7

-2 -4 12 -9 -5 14 15 7 5

Expected output:

* Polynomial 1: 7\*x^8 + 4\*x^7 - 6\*x^6 - 4\*x^5 - 7\*x^4 - 7\*x^3 + 3\*x^2 - 8\*x + 15
* Polynomial 2: 5\*x^8 + 7\*x^7 + 15\*x^6 + 14\*x^5 - 5\*x^4 - 9\*x^3 + 12\*x^2 - 4\*x - 2
* Sum: 12\*x^8 + 11\*x^7 + 9\*x^6 + 10\*x^5 - 12\*x^4 - 16\*x^3 + 15\*x^2 - 12\*x + 13
* Subtraction: 2\*x^8 - 3\*x^7 - 21\*x^6 - 18\*x^5 - 2\*x^4 + 2\*x^3 - 9\*x^2 - 4\*x + 17
* Product: 35\*x^16 + 69\*x^15 + 103\*x^14 + 96\*x^13 - 132\*x^12 - 311\*x^11 - 117\*x^10 - 128\*x^9 - 65\*x^8 + 93\*x^7 + 105\*x^6 + 175\*x^5 + 75\*x^4 - 229\*x^3 + 206\*x^2 - 44\*x - 30
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 1635
* Derivative: 56\*x^7 + 28\*x^6 - 36\*x^5 - 20\*x^4 - 28\*x^3 - 21\*x^2 + 6\*x - 8
* Integral: 7\*x^9/9 + x^8/2 - 6\*x^7/7 - 2\*x^6/3 - 7\*x^5/5 - 7\*x^4/4 + x^3 - 4\*x^2 + 15\*x
* Definite integration from x=0 to x=1: 10841/1260
* Real roots of Polynomial 1: [0.897258915480619, 1.20434035671541]

**Test Case (38):**

2

14 12 -5

7 11 6

Expected output:

* Polynomial 1: -5\*x^2 + 12\*x + 14
* Polynomial 2: 6\*x^2 + 11\*x + 7
* Sum: x^2 + 23\*x + 21
* Subtraction: -11\*x^2 + x + 7
* Product: -30\*x^4 + 17\*x^3 + 181\*x^2 + 238\*x + 98
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 18
* Derivative: 12 - 10\*x
* Integral: -5\*x^3/3 + 6\*x^2 + 14\*x
* Definite integration from x=0 to x=1: 55/3
* Real roots of Polynomial 1: [-0.859126028197400, 3.25912602819740]

**Test Case (39):**

1

-5 -1

-8 5

Expected output:

* Polynomial 1: -x - 5
* Polynomial 2: 5\*x - 8
* Sum: 4\*x - 13
* Subtraction: 3 - 6\*x
* Product: -5\*x^2 - 17\*x + 40
* Degree of Polynomial: 1
* Evaluation of polynomial at x=2: -7
* Derivative: -1
* Integral: -x^2/2 - 5\*x
* Definite integration from x=0 to x=1: -11/2
* Real roots of Polynomial 1: [-5.00000000000000]

**Test Case (40):**

3

5 12 11 5

12 -3 11 11

Expected output:

* Polynomial 1: 5\*x^3 + 11\*x^2 + 12\*x + 5
* Polynomial 2: 11\*x^3 + 11\*x^2 - 3\*x + 12
* Sum: 16\*x^3 + 22\*x^2 + 9\*x + 17
* Subtraction: -6\*x^3 + 15\*x - 7
* Product: 55\*x^6 + 176\*x^5 + 238\*x^4 + 214\*x^3 + 151\*x^2 + 129\*x + 60
* Degree of Polynomial: 3
* Evaluation of polynomial at x=2: 113
* Derivative: 15\*x^2 + 22\*x + 12
* Integral: 5\*x^4/4 + 11\*x^3/3 + 6\*x^2 + 5\*x
* Definite integration from x=0 to x=1: 191/12
* Real roots of Polynomial 1: [-0.769806495369168]

**Test Case (41):**

10

-7 3 6 5 -11 -12 -6 15 0 -8 1

11 1 -7 0 3 -4 11 -9 7 8 10

Expected output:

* Polynomial 1: x^10 - 8\*x^9 + 15\*x^7 - 6\*x^6 - 12\*x^5 - 11\*x^4 + 5\*x^3 + 6\*x^2 + 3\*x - 7
* Polynomial 2: 10\*x^10 + 8\*x^9 + 7\*x^8 - 9\*x^7 + 11\*x^6 - 4\*x^5 + 3\*x^4 - 7\*x^2 + x + 11
* Sum: 11\*x^10 + 7\*x^8 + 6\*x^7 + 5\*x^6 - 16\*x^5 - 8\*x^4 + 5\*x^3 - x^2 + 4\*x + 4
* Subtraction: -9\*x^10 - 16\*x^9 - 7\*x^8 + 24\*x^7 - 17\*x^6 - 8\*x^5 - 14\*x^4 + 5\*x^3 + 13\*x^2 + 2\*x - 18
* Product: 10\*x^20 - 72\*x^19 - 57\*x^18 + 85\*x^17 + 143\*x^16 - 155\*x^15 - 348\*x^14 + 73\*x^13 - 2\*x^12 + 206\*x^11 - 137\*x^10 - 219\*x^9 - 6\*x^8 + 330\*x^7 - 72\*x^6 - 141\*x^5 - 179\*x^4 + 40\*x^3 + 118\*x^2 + 26\*x - 77
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: -2033
* Derivative: 10\*x^9 - 72\*x^8 + 105\*x^6 - 36\*x^5 - 60\*x^4 - 44\*x^3 + 15\*x^2 + 12\*x + 3
* Integral: x^11/11 - 4\*x^10/5 + 15\*x^8/8 - 6\*x^7/7 - 2\*x^6 - 11\*x^5/5 + 5\*x^4/4 + 2\*x^3 + 3\*x^2/2 - 7\*x
* Definite integration from x=0 to x=1: -3783/616
* Real roots of Polynomial 1: [-1.39990064910623, 7.76786716273708]

**Test Case (42):**

3

3 -12 -9 -12

15 -4 8 7

Expected output:

* Polynomial 1: -12\*x^3 - 9\*x^2 - 12\*x + 3
* Polynomial 2: 7\*x^3 + 8\*x^2 - 4\*x + 15
* Sum: -5\*x^3 - x^2 - 16\*x + 18
* Subtraction: -19\*x^3 - 17\*x^2 - 8\*x - 12
* Product: -84\*x^6 - 159\*x^5 - 108\*x^4 - 219\*x^3 - 63\*x^2 - 192\*x + 45
* Degree of Polynomial: 3
* Evaluation of polynomial at x=2: -153
* Derivative: -36\*x^2 - 18\*x - 12
* Integral: -3\*x^4 - 3\*x^3 - 6\*x^2 + 3\*x
* Definite integration from x=0 to x=1: -9
* Real roots of Polynomial 1: [0.208383471330505]

**Test Case (43):**

9

2 -5 3 13 7 15 -9 8 12 10

7 -4 14 14 12 8 11 -1 -2 1

Expected output:

* Polynomial 1: 10\*x^9 + 12\*x^8 + 8\*x^7 - 9\*x^6 + 15\*x^5 + 7\*x^4 + 13\*x^3 + 3\*x^2 - 5\*x + 2
* Polynomial 2: x^9 - 2\*x^8 - x^7 + 11\*x^6 + 8\*x^5 + 12\*x^4 + 14\*x^3 + 14\*x^2 - 4\*x + 7
* Sum: 11\*x^9 + 10\*x^8 + 7\*x^7 + 2\*x^6 + 23\*x^5 + 19\*x^4 + 27\*x^3 + 17\*x^2 - 9\*x + 9
* Subtraction: 9\*x^9 + 14\*x^8 + 9\*x^7 - 20\*x^6 + 7\*x^5 - 5\*x^4 - x^3 - 11\*x^2 - x - 5
* Product: 10\*x^18 - 8\*x^17 - 26\*x^16 + 73\*x^15 + 237\*x^14 + 290\*x^13 + 233\*x^12 + 467\*x^11 + 305\*x^10 + 396\*x^9 + 358\*x^8 + 523\*x^7 + 175\*x^6 + 257\*x^5 - 7\*x^4 + 37\*x^3 + 69\*x^2 - 43\*x + 14
* Degree of Polynomial: 9
* Evaluation of polynomial at x=2: 9340
* Derivative: 90\*x^8 + 96\*x^7 + 56\*x^6 - 54\*x^5 + 75\*x^4 + 28\*x^3 + 39\*x^2 + 6\*x - 5
* Integral: x^10 + 4\*x^9/3 + x^8 - 9\*x^7/7 + 5\*x^6/2 + 7\*x^5/5 + 13\*x^4/4 + x^3 - 5\*x^2/2 + 2\*x
* Definite integration from x=0 to x=1: 4073/420
* Real roots of Polynomial 1: [-0.707522165235271]

**Test Case (44):**

9

11 1 6 9 12 -13 5 -1 -6 -2

11 14 -8 2 -10 14 -10 9 9 12

Expected output:

* Polynomial 1: -2\*x^9 - 6\*x^8 - x^7 + 5\*x^6 - 13\*x^5 + 12\*x^4 + 9\*x^3 + 6\*x^2 + x + 11
* Polynomial 2: 12\*x^9 + 9\*x^8 + 9\*x^7 - 10\*x^6 + 14\*x^5 - 10\*x^4 + 2\*x^3 - 8\*x^2 + 14\*x + 11
* Sum: 10\*x^9 + 3\*x^8 + 8\*x^7 - 5\*x^6 + x^5 + 2\*x^4 + 11\*x^3 - 2\*x^2 + 15\*x + 22
* Subtraction: -14\*x^9 - 15\*x^8 - 10\*x^7 + 15\*x^6 - 27\*x^5 + 22\*x^4 + 7\*x^3 + 14\*x^2 - 13\*x
* Product: -24\*x^18 - 90\*x^17 - 84\*x^16 + 17\*x^15 - 88\*x^14 + 18\*x^13 + 91\*x^12 + 475\*x^11 - 187\*x^10 + 315\*x^9 - 92\*x^8 + 270\*x^7 - 361\*x^6 + 109\*x^5 + 102\*x^4 + 197\*x^3 - 8\*x^2 + 165\*x + 121
* Degree of Polynomial: 9
* Evaluation of polynomial at x=2: -2483
* Derivative: -18\*x^8 - 48\*x^7 - 7\*x^6 + 30\*x^5 - 65\*x^4 + 48\*x^3 + 27\*x^2 + 12\*x + 1
* Integral: -x^10/5 - 2\*x^9/3 - x^8/8 + 5\*x^7/7 - 13\*x^6/6 + 12\*x^5/5 + 9\*x^4/4 + 2\*x^3 + x^2/2 + 11\*x
* Definite integration from x=0 to x=1: 13193/840
* Real roots of Polynomial 1: [1.21993136993439]

**Test Case (45):**

11

0 -10 -11 -7 9 -4 9 -4 -12 -4 -8 -10

7 -9 -8 -13 -7 3 -10 9 7 -9 15 -12

Expected output:

* Polynomial 1: -10\*x^11 - 8\*x^10 - 4\*x^9 - 12\*x^8 - 4\*x^7 + 9\*x^6 - 4\*x^5 + 9\*x^4 - 7\*x^3 - 11\*x^2 - 10\*x
* Polynomial 2: -12\*x^11 + 15\*x^10 - 9\*x^9 + 7\*x^8 + 9\*x^7 - 10\*x^6 + 3\*x^5 - 7\*x^4 - 13\*x^3 - 8\*x^2 - 9\*x + 7
* Sum: -22\*x^11 + 7\*x^10 - 13\*x^9 - 5\*x^8 + 5\*x^7 - x^6 - x^5 + 2\*x^4 - 20\*x^3 - 19\*x^2 - 19\*x + 7
* Subtraction: 2\*x^11 - 23\*x^10 + 5\*x^9 - 19\*x^8 - 13\*x^7 + 19\*x^6 - 7\*x^5 + 16\*x^4 + 6\*x^3 - 3\*x^2 - x - 7
* Product: 120\*x^22 - 54\*x^21 + 18\*x^20 + 86\*x^19 - 242\*x^18 - 60\*x^17 + 149\*x^16 - 299\*x^15 + 576\*x^14 + 215\*x^13 + 233\*x^12 + 266\*x^11 - 87\*x^10 - 49\*x^9 - 132\*x^8 - 78\*x^7 + 165\*x^6 + 160\*x^5 + 344\*x^4 + 130\*x^3 + 13\*x^2 - 70\*x
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: -33832
* Derivative: -110\*x^10 - 80\*x^9 - 36\*x^8 - 96\*x^7 - 28\*x^6 + 54\*x^5 - 20\*x^4 + 36\*x^3 - 21\*x^2 - 22\*x - 10
* Integral: -5\*x^12/6 - 8\*x^11/11 - 2\*x^10/5 - 4\*x^9/3 - x^8/2 + 9\*x^7/7 - 2\*x^6/3 + 9\*x^5/5 - 7\*x^4/4 - 11\*x^3/3 - 5\*x^2
* Definite integration from x=0 to x=1: -18159/1540
* Real roots of Polynomial 1: [0]

**Test Case (46):**

10

-13 12 15 5 12 -2 13 -10 2 12 15

-12 -14 -10 -2 1 -3 14 1 -8 -10 -11

Expected output:

* Polynomial 1: 15\*x^10 + 12\*x^9 + 2\*x^8 - 10\*x^7 + 13\*x^6 - 2\*x^5 + 12\*x^4 + 5\*x^3 + 15\*x^2 + 12\*x - 13
* Polynomial 2: -11\*x^10 - 10\*x^9 - 8\*x^8 + x^7 + 14\*x^6 - 3\*x^5 + x^4 - 2\*x^3 - 10\*x^2 - 14\*x - 12
* Sum: 4\*x^10 + 2\*x^9 - 6\*x^8 - 9\*x^7 + 27\*x^6 - 5\*x^5 + 13\*x^4 + 3\*x^3 + 5\*x^2 - 2\*x - 25
* Subtraction: 26\*x^10 + 22\*x^9 + 10\*x^8 - 11\*x^7 - x^6 + x^5 + 11\*x^4 + 7\*x^3 + 25\*x^2 + 26\*x - 1
* Product: -165\*x^20 - 282\*x^19 - 262\*x^18 + 9\*x^17 + 163\*x^16 + 97\*x^15 - 219\*x^14 - 310\*x^13 - 273\*x^12 - 721\*x^11 - 253\*x^10 - 17\*x^9 + 313\*x^8 + 49\*x^7 - 461\*x^6 - 173\*x^5 - 401\*x^4 - 364\*x^3 - 218\*x^2 + 38\*x + 156
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: 21807
* Derivative: 150\*x^9 + 108\*x^8 + 16\*x^7 - 70\*x^6 + 78\*x^5 - 10\*x^4 + 48\*x^3 + 15\*x^2 + 30\*x + 12
* Integral: 15\*x^11/11 + 6\*x^10/5 + 2\*x^9/9 - 5\*x^8/4 + 13\*x^7/7 - x^6/3 + 12\*x^5/5 + 5\*x^4/4 + 5\*x^3 + 6\*x^2 - 13\*x
* Definite integration from x=0 to x=1: 16319/3465
* Real roots of Polynomial 1: [-0.844906891680878, 0.543466379580882]

**Test Case (47):**

10

13 13 6 12 -7 14 14 6 14 8 15

-6 15 -2 -10 13 -2 6 -11 13 11 -3

Expected output:

* Polynomial 1: 15\*x^10 + 8\*x^9 + 14\*x^8 + 6\*x^7 + 14\*x^6 + 14\*x^5 - 7\*x^4 + 12\*x^3 + 6\*x^2 + 13\*x + 13
* Polynomial 2: -3\*x^10 + 11\*x^9 + 13\*x^8 - 11\*x^7 + 6\*x^6 - 2\*x^5 + 13\*x^4 - 10\*x^3 - 2\*x^2 + 15\*x - 6
* Sum: 12\*x^10 + 19\*x^9 + 27\*x^8 - 5\*x^7 + 20\*x^6 + 12\*x^5 + 6\*x^4 + 2\*x^3 + 4\*x^2 + 28\*x + 7
* Subtraction: 18\*x^10 - 3\*x^9 + x^8 + 17\*x^7 + 8\*x^6 + 16\*x^5 - 20\*x^4 + 22\*x^3 + 8\*x^2 - 2\*x + 19
* Product: -45\*x^20 + 141\*x^19 + 241\*x^18 + 75\*x^17 + 208\*x^16 + 54\*x^15 + 554\*x^14 - 123\*x^13 + 13\*x^12 + 463\*x^11 + 104\*x^10 + 524\*x^9 - 215\*x^8 + 295\*x^7 + 150\*x^6 - 130\*x^5 + 249\*x^4 - 138\*x^3 + 133\*x^2 + 117\*x - 78
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: 25199
* Derivative: 150\*x^9 + 72\*x^8 + 112\*x^7 + 42\*x^6 + 84\*x^5 + 70\*x^4 - 28\*x^3 + 36\*x^2 + 12\*x + 13
* Integral: 15\*x^11/11 + 4\*x^10/5 + 14\*x^9/9 + 3\*x^8/4 + 2\*x^7 + 7\*x^6/3 - 7\*x^5/5 + 3\*x^4 + 2\*x^3 + 13\*x^2/2 + 13\*x
* Definite integration from x=0 to x=1: 63167/1980
* Real roots of Polynomial 1: [-0.975663652620722, -0.726675078704735]

**Test Case (48):**

3

1 -4 -11 1

-9 -8 -11 9

Expected output:

* Polynomial 1: x^3 - 11\*x^2 - 4\*x + 1
* Polynomial 2: 9\*x^3 - 11\*x^2 - 8\*x - 9
* Sum: 10\*x^3 - 22\*x^2 - 12\*x - 8
* Subtraction: -8\*x^3 + 4\*x + 10
* Product: 9\*x^6 - 110\*x^5 + 77\*x^4 + 132\*x^3 + 120\*x^2 + 28\*x - 9
* Degree of Polynomial: 3
* Evaluation of polynomial at x=2: -43
* Derivative: 3\*x^2 - 22\*x - 4
* Integral: x^4/4 - 11\*x^3/3 - 2\*x^2 + x
* Definite integration from x=0 to x=1: -53/12
* Real roots of Polynomial 1: [-0.515729471589257, 0.170915188827179, 11.3448142827621]

**Test Case (49):**

1

7 9

2 5

Expected output:

* Polynomial 1: 9\*x + 7
* Polynomial 2: 5\*x + 2
* Sum: 14\*x + 9
* Subtraction: 4\*x + 5
* Product: 45\*x^2 + 53\*x + 14
* Degree of Polynomial: 1
* Evaluation of polynomial at x=2: 25
* Derivative: 9
* Integral: 9\*x^2/2 + 7\*x
* Definite integration from x=0 to x=1: 23/2
* Real roots of Polynomial 1: [-0.777777777777778]

**Test Case (50):**

8

-1 -14 -2 0 -6 -1 -9 3 8

-11 -2 8 8 9 13 -11 -11 3

Expected output:

* Polynomial 1: 8\*x^8 + 3\*x^7 - 9\*x^6 - x^5 - 6\*x^4 - 2\*x^2 - 14\*x - 1
* Polynomial 2: 3\*x^8 - 11\*x^7 - 11\*x^6 + 13\*x^5 + 9\*x^4 + 8\*x^3 + 8\*x^2 - 2\*x - 11
* Sum: 11\*x^8 - 8\*x^7 - 20\*x^6 + 12\*x^5 + 3\*x^4 + 8\*x^3 + 6\*x^2 - 16\*x - 12
* Subtraction: 5\*x^8 + 14\*x^7 + 2\*x^6 - 14\*x^5 - 15\*x^4 - 8\*x^3 - 10\*x^2 - 12\*x + 10
* Product: 24\*x^16 - 79\*x^15 - 148\*x^14 + 167\*x^13 + 203\*x^12 + 51\*x^11 + 54\*x^10 - 171\*x^9 - 55\*x^8 + 68\*x^7 - 136\*x^6 - 132\*x^5 - 71\*x^4 - 116\*x^3 + 42\*x^2 + 156\*x + 11
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 1691
* Derivative: 64\*x^7 + 21\*x^6 - 54\*x^5 - 5\*x^4 - 24\*x^3 - 4\*x - 14
* Integral: 8\*x^9/9 + 3\*x^8/8 - 9\*x^7/7 - x^6/6 - 6\*x^5/5 - 2\*x^3/3 - 7\*x^2 - x
* Definite integration from x=0 to x=1: -25339/2520
* Real roots of Polynomial 1: [-1.21828557932038, -1.11205400025881, -0.0721845324364572, 1.31228863373530]

**Test Case (51):**

2

-13 1 3

-14 -2 11

Expected output:

* Polynomial 1: 3\*x^2 + x - 13
* Polynomial 2: 11\*x^2 - 2\*x - 14
* Sum: 14\*x^2 - x - 27
* Subtraction: -8\*x^2 + 3\*x + 1
* Product: 33\*x^4 + 5\*x^3 - 187\*x^2 + 12\*x + 182
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 1
* Derivative: 6\*x + 1
* Integral: x^3 + x^2/2 - 13\*x
* Definite integration from x=0 to x=1: -23/2
* Real roots of Polynomial 1: [-2.25499401435694, 1.92166068102361]

**Test Case (52):**

2

-14 0 -9

-2 -11 0

Expected output:

* Polynomial 1: -9\*x^2 - 14
* Polynomial 2: -11\*x - 2
* Sum: -9\*x^2 - 11\*x - 16
* Subtraction: -9\*x^2 + 11\*x - 12
* Product: 99\*x^3 + 18\*x^2 + 154\*x + 28
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: -50
* Derivative: -18\*x
* Integral: -3\*x^3 - 14\*x
* Definite integration from x=0 to x=1: -17
* Real roots of Polynomial 1: []

**Test Case (53):**

4

9 -13 8 11 10

-1 -14 -3 2 7

Expected output:

* Polynomial 1: 10\*x^4 + 11\*x^3 + 8\*x^2 - 13\*x + 9
* Polynomial 2: 7\*x^4 + 2\*x^3 - 3\*x^2 - 14\*x - 1
* Sum: 17\*x^4 + 13\*x^3 + 5\*x^2 - 27\*x + 8
* Subtraction: 3\*x^4 + 9\*x^3 + 11\*x^2 + x + 10
* Product: 70\*x^8 + 97\*x^7 + 48\*x^6 - 248\*x^5 - 151\*x^4 - 66\*x^3 + 147\*x^2 - 113\*x - 9
* Degree of Polynomial: 4
* Evaluation of polynomial at x=2: 263
* Derivative: 40\*x^3 + 33\*x^2 + 16\*x - 13
* Integral: 2\*x^5 + 11\*x^4/4 + 8\*x^3/3 - 13\*x^2/2 + 9\*x
* Definite integration from x=0 to x=1: 119/12
* Real roots of Polynomial 1: []

**Test Case (54):**

3

0 -7 -14 -13

-6 10 5 7

Expected output:

* Polynomial 1: -13\*x^3 - 14\*x^2 - 7\*x
* Polynomial 2: 7\*x^3 + 5\*x^2 + 10\*x - 6
* Sum: -6\*x^3 - 9\*x^2 + 3\*x - 6
* Subtraction: -20\*x^3 - 19\*x^2 - 17\*x + 6
* Product: -91\*x^6 - 163\*x^5 - 249\*x^4 - 97\*x^3 + 14\*x^2 + 42\*x
* Degree of Polynomial: 3
* Evaluation of polynomial at x=2: -174
* Derivative: -39\*x^2 - 28\*x - 7
* Integral: -13\*x^4/4 - 14\*x^3/3 - 7\*x^2/2
* Definite integration from x=0 to x=1: -137/12
* Real roots of Polynomial 1: [0]

**Test Case (55):**

8

12 -6 13 8 -10 -8 13 0 5

-4 0 -14 -2 3 -2 9 6 -7

Expected output:

* Polynomial 1: 5\*x^8 + 13\*x^6 - 8\*x^5 - 10\*x^4 + 8\*x^3 + 13\*x^2 - 6\*x + 12
* Polynomial 2: -7\*x^8 + 6\*x^7 + 9\*x^6 - 2\*x^5 + 3\*x^4 - 2\*x^3 - 14\*x^2 - 4
* Sum: -2\*x^8 + 6\*x^7 + 22\*x^6 - 10\*x^5 - 7\*x^4 + 6\*x^3 - x^2 - 6\*x + 8
* Subtraction: 12\*x^8 - 6\*x^7 + 4\*x^6 - 6\*x^5 - 13\*x^4 + 10\*x^3 + 27\*x^2 - 6\*x + 16
* Product: -35\*x^16 + 30\*x^15 - 46\*x^14 + 124\*x^13 + 154\*x^12 - 224\*x^11 - 148\*x^10 + 162\*x^9 - 235\*x^8 + 148\*x^7 + 231\*x^6 - 148\*x^5 - 94\*x^4 + 28\*x^3 - 220\*x^2 + 24\*x - 48
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 1812
* Derivative: 40\*x^7 + 78\*x^5 - 40\*x^4 - 40\*x^3 + 24\*x^2 + 26\*x - 6
* Integral: 5\*x^9/9 + 13\*x^7/7 - 4\*x^6/3 - 2\*x^5 + 2\*x^4 + 13\*x^3/3 - 3\*x^2 + 12\*x
* Definite integration from x=0 to x=1: 908/63
* Real roots of Polynomial 1: []

**Test Case (56):**

11

10 -11 1 -10 8 11 2 12 -8 3 0 -14

2 -9 8 -4 4 -11 -14 14 9 8 -5 -14

Expected output:

* Polynomial 1: -14\*x^11 + 3\*x^9 - 8\*x^8 + 12\*x^7 + 2\*x^6 + 11\*x^5 + 8\*x^4 - 10\*x^3 + x^2 - 11\*x + 10
* Polynomial 2: -14\*x^11 - 5\*x^10 + 8\*x^9 + 9\*x^8 + 14\*x^7 - 14\*x^6 - 11\*x^5 + 4\*x^4 - 4\*x^3 + 8\*x^2 - 9\*x + 2
* Sum: -28\*x^11 - 5\*x^10 + 11\*x^9 + x^8 + 26\*x^7 - 12\*x^6 + 12\*x^4 - 14\*x^3 + 9\*x^2 - 20\*x + 12
* Subtraction: 5\*x^10 - 5\*x^9 - 17\*x^8 - 2\*x^7 + 16\*x^6 + 22\*x^5 + 4\*x^4 - 6\*x^3 - 7\*x^2 - 2\*x + 8
* Product: 196\*x^22 + 70\*x^21 - 154\*x^20 - 29\*x^19 - 300\*x^18 + 71\*x^17 + 56\*x^16 - 253\*x^15 + 509\*x^14 + 47\*x^13 + 217\*x^12 - 155\*x^11 - 633\*x^10 + 257\*x^9 - 88\*x^8 + 305\*x^7 - 6\*x^6 - 288\*x^5 + 198\*x^4 - 157\*x^3 + 181\*x^2 - 112\*x + 20
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: -27128
* Derivative: -154\*x^10 + 27\*x^8 - 64\*x^7 + 84\*x^6 + 12\*x^5 + 55\*x^4 + 32\*x^3 - 30\*x^2 + 2\*x - 11
* Integral: -7\*x^12/6 + 3\*x^10/10 - 8\*x^9/9 + 3\*x^8/2 + 2\*x^7/7 + 11\*x^6/6 + 8\*x^5/5 - 5\*x^4/2 + x^3/3 - 11\*x^2/2 + 10\*x
* Definite integration from x=0 to x=1: 1826/315
* Real roots of Polynomial 1: [1.05172544640702]

**Test Case (57):**

9

-12 -4 14 14 -5 14 -12 -5 -3 -10

-10 4 -3 -2 2 -3 3 11 -4 13

Expected output:

* Polynomial 1: -10\*x^9 - 3\*x^8 - 5\*x^7 - 12\*x^6 + 14\*x^5 - 5\*x^4 + 14\*x^3 + 14\*x^2 - 4\*x - 12
* Polynomial 2: 13\*x^9 - 4\*x^8 + 11\*x^7 + 3\*x^6 - 3\*x^5 + 2\*x^4 - 2\*x^3 - 3\*x^2 + 4\*x - 10
* Sum: 3\*x^9 - 7\*x^8 + 6\*x^7 - 9\*x^6 + 11\*x^5 - 3\*x^4 + 12\*x^3 + 11\*x^2 - 22
* Subtraction: -23\*x^9 + x^8 - 16\*x^7 - 15\*x^6 + 17\*x^5 - 7\*x^4 + 16\*x^3 + 17\*x^2 - 8\*x - 2
* Product: -130\*x^18 + x^17 - 163\*x^16 - 199\*x^15 + 196\*x^14 - 279\*x^13 + 349\*x^12 + 175\*x^11 - 56\*x^10 + 226\*x^9 + 12\*x^8 - 188\*x^7 + 167\*x^6 - 202\*x^5 + 48\*x^4 - 48\*x^3 - 120\*x^2 - 8\*x + 120
* Degree of Polynomial: 9
* Evaluation of polynomial at x=2: -6780
* Derivative: -90\*x^8 - 24\*x^7 - 35\*x^6 - 72\*x^5 + 70\*x^4 - 20\*x^3 + 42\*x^2 + 28\*x - 4
* Integral: -x^10 - x^9/3 - 5\*x^8/8 - 12\*x^7/7 + 7\*x^6/3 - x^5 + 7\*x^4/2 + 14\*x^3/3 - 2\*x^2 - 12\*x
* Definite integration from x=0 to x=1: -1373/168
* Real roots of Polynomial 1: [-1.37582721955722]

**Test Case (58):**

2

15 -9 5

-10 -4 14

Expected output:

* Polynomial 1: 5\*x^2 - 9\*x + 15
* Polynomial 2: 14\*x^2 - 4\*x - 10
* Sum: 19\*x^2 - 13\*x + 5
* Subtraction: -9\*x^2 - 5\*x + 25
* Product: 70\*x^4 - 146\*x^3 + 196\*x^2 + 30\*x - 150
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 17
* Derivative: 10\*x - 9
* Integral: 5\*x^3/3 - 9\*x^2/2 + 15\*x
* Definite integration from x=0 to x=1: 73/6
* Real roots of Polynomial 1: []

**Test Case (59):**

10

-10 7 1 -4 -10 13 -1 -12 8 -5 8

-11 5 15 3 -10 -3 10 -4 5 5 -9

Expected output:

* Polynomial 1: 8\*x^10 - 5\*x^9 + 8\*x^8 - 12\*x^7 - x^6 + 13\*x^5 - 10\*x^4 - 4\*x^3 + x^2 + 7\*x - 10
* Polynomial 2: -9\*x^10 + 5\*x^9 + 5\*x^8 - 4\*x^7 + 10\*x^6 - 3\*x^5 - 10\*x^4 + 3\*x^3 + 15\*x^2 + 5\*x - 11
* Sum: -x^10 + 13\*x^8 - 16\*x^7 + 9\*x^6 + 10\*x^5 - 20\*x^4 - x^3 + 16\*x^2 + 12\*x - 21
* Subtraction: 17\*x^10 - 10\*x^9 + 3\*x^8 - 8\*x^7 - 11\*x^6 + 16\*x^5 - 7\*x^3 - 14\*x^2 + 2\*x + 1
* Product: -72\*x^20 + 85\*x^19 - 57\*x^18 + 91\*x^17 + 89\*x^16 - 288\*x^15 + 213\*x^14 - 15\*x^13 - 80\*x^12 + 204\*x^11 - 12\*x^10 - 247\*x^9 - 80\*x^8 + 439\*x^7 - 217\*x^6 - 290\*x^5 + 226\*x^4 + 124\*x^3 - 126\*x^2 - 127\*x + 110
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: 6312
* Derivative: 80\*x^9 - 45\*x^8 + 64\*x^7 - 84\*x^6 - 6\*x^5 + 65\*x^4 - 40\*x^3 - 12\*x^2 + 2\*x + 7
* Integral: 8\*x^11/11 - x^10/2 + 8\*x^9/9 - 3\*x^8/2 - x^7/7 + 13\*x^6/6 - 2\*x^5 - x^4 + x^3/3 + 7\*x^2/2 - 10\*x
* Definite integration from x=0 to x=1: -5216/693
* Real roots of Polynomial 1: [-1.01638708440148, 1.09080446322817]

**Test Case (60):**

7

12 12 11 13 2 -3 -4 12

7 5 4 9 10 -7 0 2

Expected output:

* Polynomial 1: 12\*x^7 - 4\*x^6 - 3\*x^5 + 2\*x^4 + 13\*x^3 + 11\*x^2 + 12\*x + 12
* Polynomial 2: 2\*x^7 - 7\*x^5 + 10\*x^4 + 9\*x^3 + 4\*x^2 + 5\*x + 7
* Sum: 14\*x^7 - 4\*x^6 - 10\*x^5 + 12\*x^4 + 22\*x^3 + 15\*x^2 + 17\*x + 19
* Subtraction: 10\*x^7 - 4\*x^6 + 4\*x^5 - 8\*x^4 + 4\*x^3 + 7\*x^2 + 7\*x + 5
* Product: 24\*x^14 - 8\*x^13 - 90\*x^12 + 152\*x^11 + 115\*x^10 - 10\*x^9 - 30\*x^8 + 147\*x^7 + 108\*x^6 + 176\*x^5 + 351\*x^4 + 302\*x^3 + 185\*x^2 + 144\*x + 84
* Degree of Polynomial: 7
* Evaluation of polynomial at x=2: 1400
* Derivative: 84\*x^6 - 24\*x^5 - 15\*x^4 + 8\*x^3 + 39\*x^2 + 22\*x + 12
* Integral: 3\*x^8/2 - 4\*x^7/7 - x^6/2 + 2\*x^5/5 + 13\*x^4/4 + 11\*x^3/3 + 6\*x^2 + 12\*x
* Definite integration from x=0 to x=1: 10813/420
* Real roots of Polynomial 1: [-0.824496081676822]

**Test Case (61):**

11

8 -13 -8 -3 3 3 -10 9 -8 -3 -2 12

13 -10 0 12 8 7 -1 -3 -1 -14 -2 1

Expected output:

* Polynomial 1: 12\*x^11 - 2\*x^10 - 3\*x^9 - 8\*x^8 + 9\*x^7 - 10\*x^6 + 3\*x^5 + 3\*x^4 - 3\*x^3 - 8\*x^2 - 13\*x + 8
* Polynomial 2: x^11 - 2\*x^10 - 14\*x^9 - x^8 - 3\*x^7 - x^6 + 7\*x^5 + 8\*x^4 + 12\*x^3 - 10\*x + 13
* Sum: 13\*x^11 - 4\*x^10 - 17\*x^9 - 9\*x^8 + 6\*x^7 - 11\*x^6 + 10\*x^5 + 11\*x^4 + 9\*x^3 - 8\*x^2 - 23\*x + 21
* Subtraction: 11\*x^11 + 11\*x^9 - 7\*x^8 + 12\*x^7 - 9\*x^6 - 4\*x^5 - 5\*x^4 - 15\*x^3 - 8\*x^2 - 3\*x - 5
* Product: 12\*x^22 - 26\*x^21 - 167\*x^20 + 14\*x^19 + 33\*x^18 + 81\*x^17 + 237\*x^15 + 47\*x^14 - 130\*x^13 - 114\*x^12 + 219\*x^11 + 233\*x^10 - 106\*x^9 - 116\*x^8 + 162\*x^7 - 359\*x^6 - 135\*x^5 - 23\*x^4 + 137\*x^3 + 26\*x^2 - 249\*x + 104
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: 19526
* Derivative: 132\*x^10 - 20\*x^9 - 27\*x^8 - 64\*x^7 + 63\*x^6 - 60\*x^5 + 15\*x^4 + 12\*x^3 - 9\*x^2 - 16\*x - 13
* Integral: x^12 - 2\*x^11/11 - 3\*x^10/10 - 8\*x^9/9 + 9\*x^8/8 - 10\*x^7/7 + x^6/2 + 3\*x^5/5 - 3\*x^4/4 - 8\*x^3/3 - 13\*x^2/2 + 8\*x
* Definite integration from x=0 to x=1: -41329/27720
* Real roots of Polynomial 1: [-0.894314077233792, 0.467392769994391, 1.13770115329108]

**Test Case (62):**

11

6 0 -5 -14 -10 -9 -2 -11 -13 -8 0 -8

-5 10 -1 4 -12 -12 -1 12 4 -3 -5 6

Expected output:

* Polynomial 1: -8\*x^11 - 8\*x^9 - 13\*x^8 - 11\*x^7 - 2\*x^6 - 9\*x^5 - 10\*x^4 - 14\*x^3 - 5\*x^2 + 6
* Polynomial 2: 6\*x^11 - 5\*x^10 - 3\*x^9 + 4\*x^8 + 12\*x^7 - x^6 - 12\*x^5 - 12\*x^4 + 4\*x^3 - x^2 + 10\*x - 5
* Sum: -2\*x^11 - 5\*x^10 - 11\*x^9 - 9\*x^8 + x^7 - 3\*x^6 - 21\*x^5 - 22\*x^4 - 10\*x^3 - 6\*x^2 + 10\*x + 1
* Subtraction: -14\*x^11 + 5\*x^10 - 5\*x^9 - 17\*x^8 - 23\*x^7 - x^6 + 3\*x^5 + 2\*x^4 - 18\*x^3 - 4\*x^2 - 10\*x + 11
* Product: -48\*x^22 + 40\*x^21 - 24\*x^20 - 70\*x^19 - 73\*x^18 + 58\*x^17 - 63\*x^16 - 105\*x^15 - 70\*x^14 + 281\*x^13 + 97\*x^12 + 36\*x^11 - 187\*x^10 + 77\*x^9 + 238\*x^8 + 304\*x^7 - 72\*x^6 - 133\*x^5 - 157\*x^4 + 44\*x^3 + 19\*x^2 + 60\*x - 30
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: -25918
* Derivative: -88\*x^10 - 72\*x^8 - 104\*x^7 - 77\*x^6 - 12\*x^5 - 45\*x^4 - 40\*x^3 - 42\*x^2 - 10\*x
* Integral: -2\*x^12/3 - 4\*x^10/5 - 13\*x^9/9 - 11\*x^8/8 - 2\*x^7/7 - 3\*x^6/2 - 2\*x^5 - 7\*x^4/2 - 5\*x^3/3 + 6\*x
* Definite integration from x=0 to x=1: -18241/2520
* Real roots of Polynomial 1: [0.561657218866464]

**Test Case (63):**

8

-1 -3 -1 7 8 3 1 -7 12

10 -5 12 11 1 -6 -9 1 13

Expected output:

* Polynomial 1: 12\*x^8 - 7\*x^7 + x^6 + 3\*x^5 + 8\*x^4 + 7\*x^3 - x^2 - 3\*x - 1
* Polynomial 2: 13\*x^8 + x^7 - 9\*x^6 - 6\*x^5 + x^4 + 11\*x^3 + 12\*x^2 - 5\*x + 10
* Sum: 25\*x^8 - 6\*x^7 - 8\*x^6 - 3\*x^5 + 9\*x^4 + 18\*x^3 + 11\*x^2 - 8\*x + 9
* Subtraction: -x^8 - 8\*x^7 + 10\*x^6 + 9\*x^5 + 7\*x^4 - 4\*x^3 - 13\*x^2 + 2\*x - 11
* Product: 156\*x^16 - 79\*x^15 - 102\*x^14 + 31\*x^13 + 152\*x^12 + 191\*x^11 - 28\*x^10 - 281\*x^9 + 159\*x^8 + 88\*x^7 + 194\*x^6 + 66\*x^5 - x^4 + 28\*x^3 - 7\*x^2 - 25\*x - 10
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 2509
* Derivative: 96\*x^7 - 49\*x^6 + 6\*x^5 + 15\*x^4 + 32\*x^3 + 21\*x^2 - 2\*x - 3
* Integral: 4\*x^9/3 - 7\*x^8/8 + x^7/7 + x^6/2 + 8\*x^5/5 + 7\*x^4/4 - x^3/3 - 3\*x^2/2 - x
* Definite integration from x=0 to x=1: 453/280
* Real roots of Polynomial 1: [-0.550505818913935, 0.623131315365927]

**Test Case (64):**

5

-14 7 -5 1 15 14

5 7 15 0 -8 -2

Expected output:

* Polynomial 1: 14\*x^5 + 15\*x^4 + x^3 - 5\*x^2 + 7\*x - 14
* Polynomial 2: -2\*x^5 - 8\*x^4 + 15\*x^2 + 7\*x + 5
* Sum: 12\*x^5 + 7\*x^4 + x^3 + 10\*x^2 + 14\*x - 9
* Subtraction: 16\*x^5 + 23\*x^4 + x^3 - 20\*x^2 - 19
* Product: -28\*x^10 - 142\*x^9 - 122\*x^8 + 212\*x^7 + 349\*x^6 + 162\*x^5 + 119\*x^4 + 75\*x^3 - 186\*x^2 - 63\*x - 70
* Degree of Polynomial: 5
* Evaluation of polynomial at x=2: 676
* Derivative: 70\*x^4 + 60\*x^3 + 3\*x^2 - 10\*x + 7
* Integral: 7\*x^6/3 + 3\*x^5 + x^4/4 - 5\*x^3/3 + 7\*x^2/2 - 14\*x
* Definite integration from x=0 to x=1: -79/12
* Real roots of Polynomial 1: [0.805838539519455]

**Test Case (65):**

0

-11

12

Expected output:

* Polynomial 1: -11
* Polynomial 2: 12
* Sum: 1
* Subtraction: -23
* Product: -132
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: -11
* Derivative: 0
* Integral: -11\*x
* Definite integration from x=0 to x=1: -11
* Real roots of Polynomial 1: []

**Test Case (66):**

11

-13 9 11 -6 10 2 14 10 -9 -8 -7 6

-1 4 -8 2 5 -8 0 -13 0 10 1 -7

Expected output:

* Polynomial 1: 6\*x^11 - 7\*x^10 - 8\*x^9 - 9\*x^8 + 10\*x^7 + 14\*x^6 + 2\*x^5 + 10\*x^4 - 6\*x^3 + 11\*x^2 + 9\*x - 13
* Polynomial 2: -7\*x^11 + x^10 + 10\*x^9 - 13\*x^7 - 8\*x^5 + 5\*x^4 + 2\*x^3 - 8\*x^2 + 4\*x - 1
* Sum: -x^11 - 6\*x^10 + 2\*x^9 - 9\*x^8 - 3\*x^7 + 14\*x^6 - 6\*x^5 + 15\*x^4 - 4\*x^3 + 3\*x^2 + 13\*x - 14
* Subtraction: 13\*x^11 - 8\*x^10 - 18\*x^9 - 9\*x^8 + 23\*x^7 + 14\*x^6 + 10\*x^5 + 5\*x^4 - 8\*x^3 + 19\*x^2 + 5\*x - 12
* Product: -42\*x^22 + 55\*x^21 + 109\*x^20 - 15\*x^19 - 237\*x^18 - 87\*x^17 + 156\*x^16 + 275\*x^15 - 17\*x^14 - 195\*x^13 - 199\*x^12 + 30\*x^11 + 276\*x^10 - 423\*x^9 - 78\*x^8 + 101\*x^7 - 115\*x^6 + 257\*x^5 - 169\*x^4 - 48\*x^3 + 129\*x^2 - 61\*x + 13
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: 1121
* Derivative: 66\*x^10 - 70\*x^9 - 72\*x^8 - 72\*x^7 + 70\*x^6 + 84\*x^5 + 10\*x^4 + 40\*x^3 - 18\*x^2 + 22\*x + 9
* Integral: x^12/2 - 7\*x^11/11 - 4\*x^10/5 - x^9 + 5\*x^8/4 + 2\*x^7 + x^6/3 + 2\*x^5 - 3\*x^4/2 + 11\*x^3/3 + 9\*x^2/2 - 13\*x
* Definite integration from x=0 to x=1: -591/220
* Real roots of Polynomial 1: [0.677940524669666, 1.42876201805366, 1.79150066861080]

**Test Case (67):**

8

11 -12 -13 -3 14 -12 -7 -13 12

-11 0 -12 -14 8 -7 8 -6 12

Expected output:

* Polynomial 1: 12\*x^8 - 13\*x^7 - 7\*x^6 - 12\*x^5 + 14\*x^4 - 3\*x^3 - 13\*x^2 - 12\*x + 11
* Polynomial 2: 12\*x^8 - 6\*x^7 + 8\*x^6 - 7\*x^5 + 8\*x^4 - 14\*x^3 - 12\*x^2 - 11
* Sum: 24\*x^8 - 19\*x^7 + x^6 - 19\*x^5 + 22\*x^4 - 17\*x^3 - 25\*x^2 - 12\*x
* Subtraction: -7\*x^7 - 15\*x^6 - 5\*x^5 + 6\*x^4 + 11\*x^3 - x^2 - 12\*x + 22
* Product: 144\*x^16 - 228\*x^15 + 90\*x^14 - 290\*x^13 + 371\*x^12 - 439\*x^11 + 40\*x^10 - 30\*x^9 + 353\*x^8 - 4\*x^7 + 19\*x^6 + 177\*x^5 + 258\*x^4 + 23\*x^3 + 11\*x^2 + 132\*x - 121
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 711
* Derivative: 96\*x^7 - 91\*x^6 - 42\*x^5 - 60\*x^4 + 56\*x^3 - 9\*x^2 - 26\*x - 12
* Integral: 4\*x^9/3 - 13\*x^8/8 - x^7 - 2\*x^6 + 14\*x^5/5 - 3\*x^4/4 - 13\*x^3/3 - 6\*x^2 + 11\*x
* Definite integration from x=0 to x=1: -23/40
* Real roots of Polynomial 1: [0.562345249525975, 1.67448164878057]

**Test Case (68):**

8

11 -10 6 -6 12 -14 14 -8 15

5 14 -12 -2 13 1 -9 -8 5

Expected output:

* Polynomial 1: 15\*x^8 - 8\*x^7 + 14\*x^6 - 14\*x^5 + 12\*x^4 - 6\*x^3 + 6\*x^2 - 10\*x + 11
* Polynomial 2: 5\*x^8 - 8\*x^7 - 9\*x^6 + x^5 + 13\*x^4 - 2\*x^3 - 12\*x^2 + 14\*x + 5
* Sum: 20\*x^8 - 16\*x^7 + 5\*x^6 - 13\*x^5 + 25\*x^4 - 8\*x^3 - 6\*x^2 + 4\*x + 16
* Subtraction: 10\*x^8 + 23\*x^6 - 15\*x^5 - x^4 - 4\*x^3 + 18\*x^2 - 24\*x + 6
* Product: 75\*x^16 - 160\*x^15 - x^14 - 95\*x^13 + 233\*x^12 - 120\*x^11 - 26\*x^10 + 64\*x^9 + 54\*x^8 + 230\*x^7 - 289\*x^6 + 39\*x^5 + 67\*x^4 + 152\*x^3 - 242\*x^2 + 104\*x + 55
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 3423
* Derivative: 120\*x^7 - 56\*x^6 + 84\*x^5 - 70\*x^4 + 48\*x^3 - 18\*x^2 + 12\*x - 10
* Integral: 5\*x^9/3 - x^8 + 2\*x^7 - 7\*x^6/3 + 12\*x^5/5 - 3\*x^4/2 + 2\*x^3 - 5\*x^2 + 11\*x
* Definite integration from x=0 to x=1: 277/30
* Real roots of Polynomial 1: []

**Test Case (69):**

10

-1 -8 -6 -13 -11 4 -12 -14 5 1 15

-3 -6 12 -14 3 3 11 2 9 -7 14

Expected output:

* Polynomial 1: 15\*x^10 + x^9 + 5\*x^8 - 14\*x^7 - 12\*x^6 + 4\*x^5 - 11\*x^4 - 13\*x^3 - 6\*x^2 - 8\*x - 1
* Polynomial 2: 14\*x^10 - 7\*x^9 + 9\*x^8 + 2\*x^7 + 11\*x^6 + 3\*x^5 + 3\*x^4 - 14\*x^3 + 12\*x^2 - 6\*x - 3
* Sum: 29\*x^10 - 6\*x^9 + 14\*x^8 - 12\*x^7 - x^6 + 7\*x^5 - 8\*x^4 - 27\*x^3 + 6\*x^2 - 14\*x - 4
* Subtraction: x^10 + 8\*x^9 - 4\*x^8 - 16\*x^7 - 23\*x^6 + x^5 - 14\*x^4 + x^3 - 18\*x^2 - 2\*x + 2
* Product: 210\*x^20 - 91\*x^19 + 198\*x^18 - 192\*x^17 + 142\*x^16 + 80\*x^15 - 215\*x^14 - 439\*x^13 - 77\*x^12 - 391\*x^11 + 22\*x^10 - 274\*x^9 - 294\*x^8 + 169\*x^7 + 9\*x^6 - 45\*x^5 + 148\*x^4 - 7\*x^3 + 54\*x^2 + 30\*x + 3
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: 14399
* Derivative: 150\*x^9 + 9\*x^8 + 40\*x^7 - 98\*x^6 - 72\*x^5 + 20\*x^4 - 44\*x^3 - 39\*x^2 - 12\*x - 8
* Integral: 15\*x^11/11 + x^10/10 + 5\*x^9/9 - 7\*x^8/4 - 12\*x^7/7 + 2\*x^6/3 - 11\*x^5/5 - 13\*x^4/4 - 2\*x^3 - 4\*x^2 - x
* Definite integration from x=0 to x=1: -91673/6930
* Real roots of Polynomial 1: [-0.135180524161829, 1.24360959332319]

**Test Case (70):**

5

10 4 0 10 4 -8

12 15 8 1 11 -14

Expected output:

* Polynomial 1: -8\*x^5 + 4\*x^4 + 10\*x^3 + 4\*x + 10
* Polynomial 2: -14\*x^5 + 11\*x^4 + x^3 + 8\*x^2 + 15\*x + 12
* Sum: -22\*x^5 + 15\*x^4 + 11\*x^3 + 8\*x^2 + 19\*x + 22
* Subtraction: 6\*x^5 - 7\*x^4 + 9\*x^3 - 8\*x^2 - 11\*x - 2
* Product: 112\*x^10 - 144\*x^9 - 104\*x^8 + 50\*x^7 - 134\*x^6 - 52\*x^5 + 312\*x^4 + 162\*x^3 + 140\*x^2 + 198\*x + 120
* Degree of Polynomial: 5
* Evaluation of polynomial at x=2: -94
* Derivative: -40\*x^4 + 16\*x^3 + 30\*x^2 + 4
* Integral: -4\*x^6/3 + 4\*x^5/5 + 5\*x^4/2 + 2\*x^2 + 10\*x
* Definite integration from x=0 to x=1: 419/30
* Real roots of Polynomial 1: [1.59729488762336]

**Test Case (71):**

0

11

8

Expected output:

* Polynomial 1: 11
* Polynomial 2: 8
* Sum: 19
* Subtraction: 3
* Product: 88
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: 11
* Derivative: 0
* Integral: 11\*x
* Definite integration from x=0 to x=1: 11
* Real roots of Polynomial 1: []

**Test Case (72):**

7

4 2 -12 8 -10 8 -1 -6

6 4 -9 15 14 -2 0 2

Expected output:

* Polynomial 1: -6\*x^7 - x^6 + 8\*x^5 - 10\*x^4 + 8\*x^3 - 12\*x^2 + 2\*x + 4
* Polynomial 2: 2\*x^7 - 2\*x^5 + 14\*x^4 + 15\*x^3 - 9\*x^2 + 4\*x + 6
* Sum: -4\*x^7 - x^6 + 6\*x^5 + 4\*x^4 + 23\*x^3 - 21\*x^2 + 6\*x + 10
* Subtraction: -8\*x^7 - x^6 + 10\*x^5 - 24\*x^4 - 7\*x^3 - 3\*x^2 - 2\*x - 2
* Product: -12\*x^14 - 2\*x^13 + 28\*x^12 - 102\*x^11 - 104\*x^10 + 147\*x^9 - 47\*x^8 - 118\*x^7 + 64\*x^6 - 224\*x^5 + 166\*x^4 + 42\*x^3 - 100\*x^2 + 28\*x + 24
* Degree of Polynomial: 7
* Evaluation of polynomial at x=2: -712
* Derivative: -42\*x^6 - 6\*x^5 + 40\*x^4 - 40\*x^3 + 24\*x^2 - 24\*x + 2
* Integral: -3\*x^8/4 - x^7/7 + 4\*x^6/3 - 2\*x^5 + 2\*x^4 - 4\*x^3 + x^2 + 4\*x
* Definite integration from x=0 to x=1: 121/84
* Real roots of Polynomial 1: [-1.81419132091237, -0.422108531498656, 0.742239029948058]

**Test Case (73):**

11

6 9 -14 -14 -1 -1 1 4 -8 -6 -4 11

-10 5 1 1 2 -13 -8 3 6 10 13 3

Expected output:

* Polynomial 1: 11\*x^11 - 4\*x^10 - 6\*x^9 - 8\*x^8 + 4\*x^7 + x^6 - x^5 - x^4 - 14\*x^3 - 14\*x^2 + 9\*x + 6
* Polynomial 2: 3\*x^11 + 13\*x^10 + 10\*x^9 + 6\*x^8 + 3\*x^7 - 8\*x^6 - 13\*x^5 + 2\*x^4 + x^3 + x^2 + 5\*x - 10
* Sum: 14\*x^11 + 9\*x^10 + 4\*x^9 - 2\*x^8 + 7\*x^7 - 7\*x^6 - 14\*x^5 + x^4 - 13\*x^3 - 13\*x^2 + 14\*x - 4
* Subtraction: 8\*x^11 - 17\*x^10 - 16\*x^9 - 14\*x^8 + x^7 + 9\*x^6 + 12\*x^5 - 3\*x^4 - 15\*x^3 - 15\*x^2 + 4\*x + 16
* Product: 33\*x^22 + 131\*x^21 + 40\*x^20 - 76\*x^19 - 143\*x^18 - 161\*x^17 - 127\*x^16 + 116\*x^15 + 98\*x^14 - 170\*x^13 - 335\*x^12 - 233\*x^11 + 71\*x^10 + 220\*x^9 + 455\*x^8 + 63\*x^7 - 223\*x^6 - 83\*x^5 - 53\*x^4 + 85\*x^3 + 191\*x^2 - 60\*x - 60
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: 13696
* Derivative: 121\*x^10 - 40\*x^9 - 54\*x^8 - 64\*x^7 + 28\*x^6 + 6\*x^5 - 5\*x^4 - 4\*x^3 - 42\*x^2 - 28\*x + 9
* Integral: 11\*x^12/12 - 4\*x^11/11 - 3\*x^10/5 - 8\*x^9/9 + x^8/2 + x^7/7 - x^6/6 - x^5/5 - 7\*x^4/2 - 14\*x^3/3 + 9\*x^2/2 + 6\*x
* Definite integration from x=0 to x=1: 23197/13860
* Real roots of Polynomial 1: [-0.475803794005091, 0.702159766252810, 1.30057357015025]

**Test Case (74):**

0

7

-6

Expected output:

* Polynomial 1: 7
* Polynomial 2: -6
* Sum: 1
* Subtraction: 13
* Product: -42
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: 7
* Derivative: 0
* Integral: 7\*x
* Definite integration from x=0 to x=1: 7
* Real roots of Polynomial 1: []

**Test Case (75):**

4

11 -8 -2 -13 -2

-6 1 5 2 -6

Expected output:

* Polynomial 1: -2\*x^4 - 13\*x^3 - 2\*x^2 - 8\*x + 11
* Polynomial 2: -6\*x^4 + 2\*x^3 + 5\*x^2 + x - 6
* Sum: -8\*x^4 - 11\*x^3 + 3\*x^2 - 7\*x + 5
* Subtraction: 4\*x^4 - 15\*x^3 - 7\*x^2 - 9\*x + 17
* Product: 12\*x^8 + 74\*x^7 - 24\*x^6 - 23\*x^5 - 93\*x^4 + 58\*x^3 + 59\*x^2 + 59\*x - 66
* Degree of Polynomial: 4
* Evaluation of polynomial at x=2: -149
* Derivative: -8\*x^3 - 39\*x^2 - 4\*x - 8
* Integral: -2\*x^5/5 - 13\*x^4/4 - 2\*x^3/3 - 4\*x^2 + 11\*x
* Definite integration from x=0 to x=1: 161/60
* Real roots of Polynomial 1: [-6.46143177567233, 0.683820333401303]

**Test Case (76):**

2

8 -3 11

10 -3 -8

Expected output:

* Polynomial 1: 11\*x^2 - 3\*x + 8
* Polynomial 2: -8\*x^2 - 3\*x + 10
* Sum: 3\*x^2 - 6\*x + 18
* Subtraction: 19\*x^2 - 2
* Product: -88\*x^4 - 9\*x^3 + 55\*x^2 - 54\*x + 80
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 46
* Derivative: 22\*x - 3
* Integral: 11\*x^3/3 - 3\*x^2/2 + 8\*x
* Definite integration from x=0 to x=1: 61/6
* Real roots of Polynomial 1: []

**Test Case (77):**

1

-14 12

12 8

Expected output:

* Polynomial 1: 12\*x - 14
* Polynomial 2: 8\*x + 12
* Sum: 20\*x - 2
* Subtraction: 4\*x - 26
* Product: 96\*x^2 + 32\*x - 168
* Degree of Polynomial: 1
* Evaluation of polynomial at x=2: 10
* Derivative: 12
* Integral: 6\*x^2 - 14\*x
* Definite integration from x=0 to x=1: -8
* Real roots of Polynomial 1: [1.16666666666667]

**Test Case (78):**

3

0 1 -1 10 0

-8 9 15 2 -6

Expected output:

* Polynomial 1: 10\*x^3 - x^2 + x
* Polynomial 2: -6\*x^4 + 2\*x^3 + 15\*x^2 + 9\*x - 8
* Sum: -6\*x^4 + 12\*x^3 + 14\*x^2 + 10\*x - 8
* Subtraction: 6\*x^4 + 8\*x^3 - 16\*x^2 - 8\*x + 8
* Product: -60\*x^7 + 26\*x^6 + 142\*x^5 + 77\*x^4 - 74\*x^3 + 17\*x^2 - 8\*x
* Degree of Polynomial: 3
* Evaluation of polynomial at x=2: 78
* Derivative: 30\*x^2 - 2\*x + 1
* Integral: 5\*x^4/2 - x^3/3 + x^2/2
* Definite integration from x=0 to x=1: 8/3
* Real roots of Polynomial 1: [0]

**Test Case (79):**

6

9 7 8 -7 14 1 14

4 -3 10 -14 13 1 -6

Expected output:

* Polynomial 1: 14\*x^6 + x^5 + 14\*x^4 - 7\*x^3 + 8\*x^2 + 7\*x + 9
* Polynomial 2: -6\*x^6 + x^5 + 13\*x^4 - 14\*x^3 + 10\*x^2 - 3\*x + 4
* Sum: 8\*x^6 + 2\*x^5 + 27\*x^4 - 21\*x^3 + 18\*x^2 + 4\*x + 13
* Subtraction: 20\*x^6 + x^4 + 7\*x^3 - 2\*x^2 + 10\*x + 5
* Product: -84\*x^12 + 8\*x^11 + 99\*x^10 - 127\*x^9 + 253\*x^8 - 353\*x^7 + 348\*x^6 - 120\*x^5 + 176\*x^4 - 108\*x^3 + 101\*x^2 + x + 36
* Degree of Polynomial: 6
* Evaluation of polynomial at x=2: 1151
* Derivative: 84\*x^5 + 5\*x^4 + 56\*x^3 - 21\*x^2 + 16\*x + 7
* Integral: 2\*x^7 + x^6/6 + 14\*x^5/5 - 7\*x^4/4 + 8\*x^3/3 + 7\*x^2/2 + 9\*x
* Definite integration from x=0 to x=1: 1103/60
* Real roots of Polynomial 1: []

**Test Case (80):**

7

-11 15 -11 -12 -9 14 -1 14

-13 9 -11 6 13 2 13 -11

Expected output:

* Polynomial 1: 14\*x^7 - x^6 + 14\*x^5 - 9\*x^4 - 12\*x^3 - 11\*x^2 + 15\*x - 11
* Polynomial 2: -11\*x^7 + 13\*x^6 + 2\*x^5 + 13\*x^4 + 6\*x^3 - 11\*x^2 + 9\*x - 13
* Sum: 3\*x^7 + 12\*x^6 + 16\*x^5 + 4\*x^4 - 6\*x^3 - 22\*x^2 + 24\*x - 24
* Subtraction: 25\*x^7 - 14\*x^6 + 12\*x^5 - 22\*x^4 - 18\*x^3 + 6\*x + 2
* Product: -154\*x^14 + 193\*x^13 - 139\*x^12 + 461\*x^11 + 114\*x^10 - 31\*x^9 - 228\*x^8 - 261\*x^7 - 90\*x^6 - 24\*x^5 + 77\*x^4 - 174\*x^3 + 399\*x^2 - 294\*x + 143
* Degree of Polynomial: 7
* Evaluation of polynomial at x=2: 1911
* Derivative: 98\*x^6 - 6\*x^5 + 70\*x^4 - 36\*x^3 - 36\*x^2 - 22\*x + 15
* Integral: 7\*x^8/4 - x^7/7 + 7\*x^6/3 - 9\*x^5/5 - 3\*x^4 - 11\*x^3/3 + 15\*x^2/2 - 11\*x
* Definite integration from x=0 to x=1: -3371/420
* Real roots of Polynomial 1: [1.01152849625406]

**Test Case (81):**

8

11 -10 -14 -2 -11 4 -13 -3 -5

-3 -2 -8 -7 6 11 12 5 -5

Expected output:

* Polynomial 1: -5\*x^8 - 3\*x^7 - 13\*x^6 + 4\*x^5 - 11\*x^4 - 2\*x^3 - 14\*x^2 - 10\*x + 11
* Polynomial 2: -5\*x^8 + 5\*x^7 + 12\*x^6 + 11\*x^5 + 6\*x^4 - 7\*x^3 - 8\*x^2 - 2\*x - 3
* Sum: -10\*x^8 + 2\*x^7 - x^6 + 15\*x^5 - 5\*x^4 - 9\*x^3 - 22\*x^2 - 12\*x + 8
* Subtraction: -8\*x^7 - 25\*x^6 - 7\*x^5 - 17\*x^4 + 5\*x^3 - 6\*x^2 - 8\*x + 14
* Product: 25\*x^16 - 10\*x^15 - 10\*x^14 - 176\*x^13 - 144\*x^12 - 123\*x^11 - 45\*x^10 - 16\*x^9 - 264\*x^8 - 151\*x^7 + 71\*x^6 + 185\*x^5 + 285\*x^4 + 37\*x^3 - 26\*x^2 + 8\*x - 33
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: -2625
* Derivative: -40\*x^7 - 21\*x^6 - 78\*x^5 + 20\*x^4 - 44\*x^3 - 6\*x^2 - 28\*x - 10
* Integral: -5\*x^9/9 - 3\*x^8/8 - 13\*x^7/7 + 2\*x^6/3 - 11\*x^5/5 - x^4/2 - 14\*x^3/3 - 5\*x^2 + 11\*x
* Definite integration from x=0 to x=1: -8789/2520
* Real roots of Polynomial 1: [-0.822745137687817, 0.541422114305047]

**Test Case (82):**

6

-11 -1 3 0 2 -8 15

-7 -12 6 1 -8 6 9

Expected output:

* Polynomial 1: 15\*x^6 - 8\*x^5 + 2\*x^4 + 3\*x^2 - x - 11
* Polynomial 2: 9\*x^6 + 6\*x^5 - 8\*x^4 + x^3 + 6\*x^2 - 12\*x - 7
* Sum: 24\*x^6 - 2\*x^5 - 6\*x^4 + x^3 + 9\*x^2 - 13\*x - 18
* Subtraction: 6\*x^6 - 14\*x^5 + 10\*x^4 - x^3 - 3\*x^2 + 11\*x - 4
* Product: 135\*x^12 + 18\*x^11 - 150\*x^10 + 91\*x^9 + 93\*x^8 - 217\*x^7 - 126\*x^6 - 23\*x^5 + 91\*x^4 - 53\*x^3 - 75\*x^2 + 139\*x + 77
* Degree of Polynomial: 6
* Evaluation of polynomial at x=2: 735
* Derivative: 90\*x^5 - 40\*x^4 + 8\*x^3 + 6\*x - 1
* Integral: 15\*x^7/7 - 4\*x^6/3 + 2\*x^5/5 + x^3 - x^2/2 - 11\*x
* Definite integration from x=0 to x=1: -1951/210
* Real roots of Polynomial 1: [-0.815622537812514, 1.00000000000000]

**Test Case (83):**

2

14 -14 -1

1 0 12

Expected output:

* Polynomial 1: -x^2 - 14\*x + 14
* Polynomial 2: 12\*x^2 + 1
* Sum: 11\*x^2 - 14\*x + 15
* Subtraction: -13\*x^2 - 14\*x + 13
* Product: -12\*x^4 - 168\*x^3 + 167\*x^2 - 14\*x + 14
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: -18
* Derivative: -2\*x - 14
* Integral: -x^3/3 - 7\*x^2 + 14\*x
* Definite integration from x=0 to x=1: 20/3
* Real roots of Polynomial 1: [-14.9372539331938, 0.937253933193772]

**Test Case (84):**

2

5 1 10

-6 -8 -14

Expected output:

* Polynomial 1: 10\*x^2 + x + 5
* Polynomial 2: -14\*x^2 - 8\*x - 6
* Sum: -4\*x^2 - 7\*x - 1
* Subtraction: 24\*x^2 + 9\*x + 11
* Product: -140\*x^4 - 94\*x^3 - 138\*x^2 - 46\*x - 30
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 47
* Derivative: 20\*x + 1
* Integral: 10\*x^3/3 + x^2/2 + 5\*x
* Definite integration from x=0 to x=1: 53/6
* Real roots of Polynomial 1: []

**Test Case (85):**

8

10 -1 15 -11 14 -3 8 4 -6

-10 -8 5 -14 -10 9 4 -10 -10

Expected output:

* Polynomial 1: -6\*x^8 + 4\*x^7 + 8\*x^6 - 3\*x^5 + 14\*x^4 - 11\*x^3 + 15\*x^2 - x + 10
* Polynomial 2: -10\*x^8 - 10\*x^7 + 4\*x^6 + 9\*x^5 - 10\*x^4 - 14\*x^3 + 5\*x^2 - 8\*x - 10
* Sum: -16\*x^8 - 6\*x^7 + 12\*x^6 + 6\*x^5 + 4\*x^4 - 25\*x^3 + 20\*x^2 - 9\*x
* Subtraction: 4\*x^8 + 14\*x^7 + 4\*x^6 - 12\*x^5 + 24\*x^4 + 3\*x^3 + 10\*x^2 + 7\*x + 20
* Product: 60\*x^16 + 20\*x^15 - 144\*x^14 - 88\*x^13 + 18\*x^12 + 74\*x^11 - 177\*x^10 - 72\*x^9 - 159\*x^8 - 174\*x^7 + 49\*x^6 - 247\*x^5 - 63\*x^4 - 155\*x^3 - 92\*x^2 - 70\*x - 100
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: -404
* Derivative: -48\*x^7 + 28\*x^6 + 48\*x^5 - 15\*x^4 + 56\*x^3 - 33\*x^2 + 30\*x - 1
* Integral: -2\*x^9/3 + x^8/2 + 8\*x^7/7 - x^6/2 + 14\*x^5/5 - 11\*x^4/4 + 5\*x^3 - x^2/2 + 10\*x
* Definite integration from x=0 to x=1: 6311/420
* Real roots of Polynomial 1: [-1.58327556220727, 1.71953761729611]

**Test Case (86):**

6

-14 9 -6 3 -12 7 10

-3 -13 14 -2 -14 -1 12

Expected output:

* Polynomial 1: 10\*x^6 + 7\*x^5 - 12\*x^4 + 3\*x^3 - 6\*x^2 + 9\*x - 14
* Polynomial 2: 12\*x^6 - x^5 - 14\*x^4 - 2\*x^3 + 14\*x^2 - 13\*x - 3
* Sum: 22\*x^6 + 6\*x^5 - 26\*x^4 + x^3 + 8\*x^2 - 4\*x - 17
* Subtraction: -2\*x^6 + 8\*x^5 + 2\*x^4 + 5\*x^3 - 20\*x^2 + 22\*x - 11
* Product: 120\*x^12 + 74\*x^11 - 291\*x^10 - 70\*x^9 + 219\*x^8 + 64\*x^7 - 388\*x^6 + 77\*x^5 + 91\*x^4 + 223\*x^3 - 295\*x^2 + 155\*x + 42
* Degree of Polynomial: 6
* Evaluation of polynomial at x=2: 676
* Derivative: 60\*x^5 + 35\*x^4 - 48\*x^3 + 9\*x^2 - 12\*x + 9
* Integral: 10\*x^7/7 + 7\*x^6/6 - 12\*x^5/5 + 3\*x^4/4 - 2\*x^3 + 9\*x^2/2 - 14\*x
* Definite integration from x=0 to x=1: -4433/420
* Real roots of Polynomial 1: [-1.76254517978563, 1.04918639904969]

**Test Case (87):**

8

6 -3 -1 -11 15 -14 4 3 -13

-7 12 11 -4 2 5 5 -13 3

Expected output:

* Polynomial 1: -13\*x^8 + 3\*x^7 + 4\*x^6 - 14\*x^5 + 15\*x^4 - 11\*x^3 - x^2 - 3\*x + 6
* Polynomial 2: 3\*x^8 - 13\*x^7 + 5\*x^6 + 5\*x^5 + 2\*x^4 - 4\*x^3 + 11\*x^2 + 12\*x - 7
* Sum: -10\*x^8 - 10\*x^7 + 9\*x^6 - 9\*x^5 + 17\*x^4 - 15\*x^3 + 10\*x^2 + 9\*x - 1
* Subtraction: -16\*x^8 + 16\*x^7 - x^6 - 19\*x^5 + 13\*x^4 - 7\*x^3 - 12\*x^2 - 15\*x + 13
* Product: -39\*x^16 + 178\*x^15 - 92\*x^14 - 144\*x^13 + 236\*x^12 - 220\*x^11 - 2\*x^10 - 143\*x^9 + 254\*x^8 - 307\*x^7 + 26\*x^6 + 185\*x^5 - 224\*x^4 + 8\*x^3 + 37\*x^2 + 93\*x - 42
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: -2988
* Derivative: -104\*x^7 + 21\*x^6 + 24\*x^5 - 70\*x^4 + 60\*x^3 - 33\*x^2 - 2\*x - 3
* Integral: -13\*x^9/9 + 3\*x^8/8 + 4\*x^7/7 - 7\*x^6/3 + 3\*x^5 - 11\*x^4/4 - x^3/3 - 3\*x^2/2 + 6\*x
* Definite integration from x=0 to x=1: 799/504
* Real roots of Polynomial 1: [-1.35935637263198, 0.740809157696862]

**Test Case (88):**

2

-1 4 -11

-13 0 0

Expected output:

* Polynomial 1: -11\*x^2 + 4\*x - 1
* Polynomial 2: -13
* Sum: -11\*x^2 + 4\*x - 14
* Subtraction: -11\*x^2 + 4\*x + 12
* Product: 143\*x^2 - 52\*x + 13
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: -37
* Derivative: 4 - 22\*x
* Integral: -11\*x^3/3 + 2\*x^2 - x
* Definite integration from x=0 to x=1: -8/3
* Real roots of Polynomial 1: []

**Test Case (89):**

9

13 8 0 -10 3 -7 -1 -13 2 12

-2 -7 2 -11 -9 -5 14 -6 12 0

Expected output:

* Polynomial 1: 12\*x^9 + 2\*x^8 - 13\*x^7 - x^6 - 7\*x^5 + 3\*x^4 - 10\*x^3 + 8\*x + 13
* Polynomial 2: 12\*x^8 - 6\*x^7 + 14\*x^6 - 5\*x^5 - 9\*x^4 - 11\*x^3 + 2\*x^2 - 7\*x - 2
* Sum: 12\*x^9 + 14\*x^8 - 19\*x^7 + 13\*x^6 - 12\*x^5 - 6\*x^4 - 21\*x^3 + 2\*x^2 + x + 11
* Subtraction: 12\*x^9 - 10\*x^8 - 7\*x^7 - 15\*x^6 - 2\*x^5 + 12\*x^4 + x^3 - 2\*x^2 + 15\*x + 15
* Product: 144\*x^17 - 48\*x^16 + 34\*x^14 - 378\*x^13 - 21\*x^12 - 112\*x^11 + 209\*x^10 - 49\*x^9 + 293\*x^8 + 110\*x^7 + 309\*x^6 - 164\*x^5 - 141\*x^4 - 107\*x^3 - 30\*x^2 - 107\*x - 26
* Degree of Polynomial: 9
* Evaluation of polynomial at x=2: 4701
* Derivative: 108\*x^8 + 16\*x^7 - 91\*x^6 - 6\*x^5 - 35\*x^4 + 12\*x^3 - 30\*x^2 + 8
* Integral: 6\*x^10/5 + 2\*x^9/9 - 13\*x^8/8 - x^7/7 - 7\*x^6/6 + 3\*x^5/5 - 5\*x^4/2 + 4\*x^2 + 13\*x
* Definite integration from x=0 to x=1: 34241/2520
* Real roots of Polynomial 1: [-1.37922798199990]

**Test Case (90):**

5

-13 0 -11 -7 -10 11

4 -6 -6 -2 -2 -14

Expected output:

* Polynomial 1: 11\*x^5 - 10\*x^4 - 7\*x^3 - 11\*x^2 - 13
* Polynomial 2: -14\*x^5 - 2\*x^4 - 2\*x^3 - 6\*x^2 - 6\*x + 4
* Sum: -3\*x^5 - 12\*x^4 - 9\*x^3 - 17\*x^2 - 6\*x - 9
* Subtraction: 25\*x^5 - 8\*x^4 - 5\*x^3 - 5\*x^2 + 6\*x - 17
* Product: -154\*x^10 + 118\*x^9 + 96\*x^8 + 122\*x^7 + 30\*x^6 + 350\*x^5 + 94\*x^4 + 64\*x^3 + 34\*x^2 + 78\*x - 52
* Degree of Polynomial: 5
* Evaluation of polynomial at x=2: 79
* Derivative: 55\*x^4 - 40\*x^3 - 21\*x^2 - 22\*x
* Integral: 11\*x^6/6 - 2\*x^5 - 7\*x^4/4 - 11\*x^3/3 - 13\*x
* Definite integration from x=0 to x=1: -223/12
* Real roots of Polynomial 1: [1.73684576071411]

**Test Case (91):**

11

11 -5 2 10 -2 6 -13 -2 -11 -4 -12 -10

10 14 -1 10 4 13 -4 2 -9 0 6 8

Expected output:

* Polynomial 1: -10\*x^11 - 12\*x^10 - 4\*x^9 - 11\*x^8 - 2\*x^7 - 13\*x^6 + 6\*x^5 - 2\*x^4 + 10\*x^3 + 2\*x^2 - 5\*x + 11
* Polynomial 2: 8\*x^11 + 6\*x^10 - 9\*x^8 + 2\*x^7 - 4\*x^6 + 13\*x^5 + 4\*x^4 + 10\*x^3 - x^2 + 14\*x + 10
* Sum: -2\*x^11 - 6\*x^10 - 4\*x^9 - 20\*x^8 - 17\*x^6 + 19\*x^5 + 2\*x^4 + 20\*x^3 + x^2 + 9\*x + 21
* Subtraction: -18\*x^11 - 18\*x^10 - 4\*x^9 - 2\*x^8 - 4\*x^7 - 9\*x^6 - 7\*x^5 - 6\*x^4 + 3\*x^2 - 19\*x + 1
* Product: -80\*x^22 - 156\*x^21 - 104\*x^20 - 22\*x^19 + 6\*x^18 - 64\*x^17 - 21\*x^16 - 164\*x^15 + 25\*x^14 - 265\*x^13 - 184\*x^12 - 611\*x^11 - 83\*x^10 - 315\*x^9 - 60\*x^8 - 120\*x^7 - 45\*x^6 + 165\*x^5 + 112\*x^4 + 243\*x^3 - 61\*x^2 + 104\*x + 110
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: -38471
* Derivative: -110\*x^10 - 120\*x^9 - 36\*x^8 - 88\*x^7 - 14\*x^6 - 78\*x^5 + 30\*x^4 - 8\*x^3 + 30\*x^2 + 4\*x - 5
* Integral: -5\*x^12/6 - 12\*x^11/11 - 2\*x^10/5 - 11\*x^9/9 - x^8/4 - 13\*x^7/7 + x^6 - 2\*x^5/5 + 5\*x^4/2 + 2\*x^3/3 - 5\*x^2/2 + 11\*x
* Definite integration from x=0 to x=1: 91657/13860
* Real roots of Polynomial 1: [-1.60672287836317, -0.848002246375113, 0.872558996590753]

**Test Case (92):**

0

7

1

Expected output:

* Polynomial 1: 7
* Polynomial 2: 1
* Sum: 8
* Subtraction: 6
* Product: 7
* Degree of Polynomial: 0
* Evaluation of polynomial at x=2: 7
* Derivative: 0
* Integral: 7\*x
* Definite integration from x=0 to x=1: 7
* Real roots of Polynomial 1: []

**Test Case (93):**

11

-5 -1 0 -6 -8 15 -9 7 -7 9 -14 -10

10 -8 -12 -1 15 2 -4 -7 -1 6 10 12

Expected output:

* Polynomial 1: -10\*x^11 - 14\*x^10 + 9\*x^9 - 7\*x^8 + 7\*x^7 - 9\*x^6 + 15\*x^5 - 8\*x^4 - 6\*x^3 - x - 5
* Polynomial 2: 12\*x^11 + 10\*x^10 + 6\*x^9 - x^8 - 7\*x^7 - 4\*x^6 + 2\*x^5 + 15\*x^4 - x^3 - 12\*x^2 - 8\*x + 10
* Sum: 2\*x^11 - 4\*x^10 + 15\*x^9 - 8\*x^8 - 13\*x^6 + 17\*x^5 + 7\*x^4 - 7\*x^3 - 12\*x^2 - 9\*x + 5
* Subtraction: -22\*x^11 - 24\*x^10 + 3\*x^9 - 6\*x^8 + 14\*x^7 - 5\*x^6 + 13\*x^5 - 23\*x^4 - 5\*x^3 + 12\*x^2 + 7\*x - 15
* Product: -120\*x^22 - 268\*x^21 - 92\*x^20 - 68\*x^19 + 152\*x^18 + 49\*x^17 + 112\*x^16 - 172\*x^15 - 256\*x^14 + 167\*x^13 + 39\*x^12 - 70\*x^11 - 222\*x^10 + 275\*x^9 - 153\*x^8 - 81\*x^7 - 90\*x^6 + 261\*x^5 - 106\*x^4 - 43\*x^3 + 68\*x^2 + 30\*x - 50
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: -31383
* Derivative: -110\*x^10 - 140\*x^9 + 81\*x^8 - 56\*x^7 + 49\*x^6 - 54\*x^5 + 75\*x^4 - 32\*x^3 - 18\*x^2 - 1
* Integral: -5\*x^12/6 - 14\*x^11/11 + 9\*x^10/10 - 7\*x^9/9 + 7\*x^8/8 - 9\*x^7/7 + 5\*x^6/2 - 8\*x^5/5 - 3\*x^4/2 - x^2/2 - 5\*x
* Definite integration from x=0 to x=1: -235469/27720
* Real roots of Polynomial 1: [-2.13178791593010]

**Test Case (94):**

9

-7 10 -5 8 13 3 -5 11 -8 -4

-2 10 -13 7 2 -6 11 -4 9 2

Expected output:

* Polynomial 1: -4\*x^9 - 8\*x^8 + 11\*x^7 - 5\*x^6 + 3\*x^5 + 13\*x^4 + 8\*x^3 - 5\*x^2 + 10\*x - 7
* Polynomial 2: 2\*x^9 + 9\*x^8 - 4\*x^7 + 11\*x^6 - 6\*x^5 + 2\*x^4 + 7\*x^3 - 13\*x^2 + 10\*x - 2
* Sum: -2\*x^9 + x^8 + 7\*x^7 + 6\*x^6 - 3\*x^5 + 15\*x^4 + 15\*x^3 - 18\*x^2 + 20\*x - 9
* Subtraction: -6\*x^9 - 17\*x^8 + 15\*x^7 - 16\*x^6 + 9\*x^5 + 11\*x^4 + x^3 + 8\*x^2 - 5
* Product: -8\*x^18 - 52\*x^17 - 34\*x^16 + 77\*x^15 - 147\*x^14 + 234\*x^13 - 44\*x^12 + 91\*x^11 + 199\*x^10 - 138\*x^9 + 32\*x^8 + 164\*x^7 - 220\*x^6 + 47\*x^5 + 175\*x^4 - 245\*x^3 + 201\*x^2 - 90\*x + 14
* Degree of Polynomial: 9
* Evaluation of polynomial at x=2: -2647
* Derivative: -36\*x^8 - 64\*x^7 + 77\*x^6 - 30\*x^5 + 15\*x^4 + 52\*x^3 + 24\*x^2 - 10\*x + 10
* Integral: -2\*x^10/5 - 8\*x^9/9 + 11\*x^8/8 - 5\*x^7/7 + x^6/2 + 13\*x^5/5 + 2\*x^4 - 5\*x^3/3 + 5\*x^2 - 7\*x
* Definite integration from x=0 to x=1: 2029/2520
* Real roots of Polynomial 1: [-3.03933012096742, 0.568268733208900, 1.30249638162038]

**Test Case (95):**

11

-11 9 -13 8 -5 14 -4 14 14 13 3 2

3 0 -1 -11 -6 1 -11 -12 0 14 4 14

Expected output:

* Polynomial 1: 2\*x^11 + 3\*x^10 + 13\*x^9 + 14\*x^8 + 14\*x^7 - 4\*x^6 + 14\*x^5 - 5\*x^4 + 8\*x^3 - 13\*x^2 + 9\*x - 11
* Polynomial 2: 14\*x^11 + 4\*x^10 + 14\*x^9 - 12\*x^7 - 11\*x^6 + x^5 - 6\*x^4 - 11\*x^3 - x^2 + 3
* Sum: 16\*x^11 + 7\*x^10 + 27\*x^9 + 14\*x^8 + 2\*x^7 - 15\*x^6 + 15\*x^5 - 11\*x^4 - 3\*x^3 - 14\*x^2 + 9\*x - 8
* Subtraction: -12\*x^11 - x^10 - x^9 + 14\*x^8 + 26\*x^7 + 7\*x^6 + 13\*x^5 + x^4 + 19\*x^3 - 12\*x^2 + 9\*x - 14
* Product: 28\*x^22 + 50\*x^21 + 222\*x^20 + 290\*x^19 + 410\*x^18 + 138\*x^17 + 189\*x^16 - 390\*x^15 - 61\*x^14 - 425\*x^13 - 154\*x^12 - 643\*x^11 - 80\*x^10 - 106\*x^9 - 35\*x^8 + 55\*x^7 + 113\*x^6 + 112\*x^5 - 35\*x^4 + 136\*x^3 - 28\*x^2 + 27\*x - 33
* Degree of Polynomial: 11
* Evaluation of polynomial at x=2: 19331
* Derivative: 22\*x^10 + 30\*x^9 + 117\*x^8 + 112\*x^7 + 98\*x^6 - 24\*x^5 + 70\*x^4 - 20\*x^3 + 24\*x^2 - 26\*x + 9
* Integral: x^12/6 + 3\*x^11/11 + 13\*x^10/10 + 14\*x^9/9 + 7\*x^8/4 - 4\*x^7/7 + 7\*x^6/3 - x^5 + 2\*x^4 - 13\*x^3/3 + 9\*x^2/2 - 11\*x
* Definite integration from x=0 to x=1: -41947/13860
* Real roots of Polynomial 1: [0.788368205937116]

**Test Case (96):**

9

0 -2 -11 -8 5 9 15 9 12 -1

3 10 11 -1 10 -12 8 -6 10 -2

Expected output:

* Polynomial 1: -x^9 + 12\*x^8 + 9\*x^7 + 15\*x^6 + 9\*x^5 + 5\*x^4 - 8\*x^3 - 11\*x^2 - 2\*x
* Polynomial 2: -2\*x^9 + 10\*x^8 - 6\*x^7 + 8\*x^6 - 12\*x^5 + 10\*x^4 - x^3 + 11\*x^2 + 10\*x + 3
* Sum: -3\*x^9 + 22\*x^8 + 3\*x^7 + 23\*x^6 - 3\*x^5 + 15\*x^4 - 9\*x^3 + 8\*x + 3
* Subtraction: x^9 + 2\*x^8 + 15\*x^7 + 7\*x^6 + 21\*x^5 - 5\*x^4 - 7\*x^3 - 22\*x^2 - 12\*x - 3
* Product: 2\*x^18 - 34\*x^17 + 108\*x^16 - 20\*x^15 + 186\*x^14 - 92\*x^13 + 145\*x^12 - 129\*x^11 + 137\*x^10 + 213\*x^9 + 352\*x^8 + 307\*x^7 + 112\*x^6 - 20\*x^5 - 184\*x^4 - 156\*x^3 - 53\*x^2 - 6\*x
* Degree of Polynomial: 9
* Evaluation of polynomial at x=2: 4928
* Derivative: -9\*x^8 + 96\*x^7 + 63\*x^6 + 90\*x^5 + 45\*x^4 + 20\*x^3 - 24\*x^2 - 22\*x - 2
* Integral: -x^10/10 + 4\*x^9/3 + 9\*x^8/8 + 15\*x^7/7 + 3\*x^6/2 + x^5 - 2\*x^4 - 11\*x^3/3 - x^2
* Definite integration from x=0 to x=1: 281/840
* Real roots of Polynomial 1: [-0.679150358373029, -0.220914108533742, 0, 0.800687464725281, 12.7991868727897]

**Test Case (97):**

2

-4 8 11

-4 4 15

Expected output:

* Polynomial 1: 11\*x^2 + 8\*x - 4
* Polynomial 2: 15\*x^2 + 4\*x - 4
* Sum: 26\*x^2 + 12\*x - 8
* Subtraction: -4\*x^2 + 4\*x
* Product: 165\*x^4 + 164\*x^3 - 72\*x^2 - 48\*x + 16
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 56
* Derivative: 22\*x + 8
* Integral: 11\*x^3/3 + 4\*x^2 - 4\*x
* Definite integration from x=0 to x=1: 11/3
* Real roots of Polynomial 1: [-1.06781515385589, 0.340542426583167]

**Test Case (98):**

2

12 13 3

0 10 4

Expected output:

* Polynomial 1: 3\*x^2 + 13\*x + 12
* Polynomial 2: 4\*x^2 + 10\*x
* Sum: 7\*x^2 + 23\*x + 12
* Subtraction: -x^2 + 3\*x + 12
* Product: 12\*x^4 + 82\*x^3 + 178\*x^2 + 120\*x
* Degree of Polynomial: 2
* Evaluation of polynomial at x=2: 50
* Derivative: 6\*x + 13
* Integral: x^3 + 13\*x^2/2 + 12\*x
* Definite integration from x=0 to x=1: 39/2
* Real roots of Polynomial 1: [-3.00000000000000, -1.33333333333333]

**Test Case (99):**

8

-13 -2 15 14 -12 10 1 10 -3

9 -1 -10 12 10 -7 -7 -12 1

Expected output:

* Polynomial 1: -3\*x^8 + 10\*x^7 + x^6 + 10\*x^5 - 12\*x^4 + 14\*x^3 + 15\*x^2 - 2\*x - 13
* Polynomial 2: x^8 - 12\*x^7 - 7\*x^6 - 7\*x^5 + 10\*x^4 + 12\*x^3 - 10\*x^2 - x + 9
* Sum: -2\*x^8 - 2\*x^7 - 6\*x^6 + 3\*x^5 - 2\*x^4 + 26\*x^3 + 5\*x^2 - 3\*x - 4
* Subtraction: -4\*x^8 + 22\*x^7 + 8\*x^6 + 17\*x^5 - 22\*x^4 + 2\*x^3 + 25\*x^2 - x - 22
* Product: -3\*x^16 + 46\*x^15 - 98\*x^14 - 51\*x^13 - 239\*x^12 + 145\*x^11 + 21\*x^10 - 181\*x^9 - 239\*x^8 + 50\*x^7 + 542\*x^6 + 213\*x^5 - 426\*x^4 - 25\*x^3 + 267\*x^2 - 5\*x - 117
* Degree of Polynomial: 8
* Evaluation of polynomial at x=2: 859
* Derivative: -24\*x^7 + 70\*x^6 + 6\*x^5 + 50\*x^4 - 48\*x^3 + 42\*x^2 + 30\*x - 2
* Integral: -x^9/3 + 5\*x^8/4 + x^7/7 + 5\*x^6/3 - 12\*x^5/5 + 7\*x^4/2 + 5\*x^3 - x^2 - 13\*x
* Definite integration from x=0 to x=1: -2173/420
* Real roots of Polynomial 1: [0.757206027604741, 3.62867777155089]

**Test Case (100):**

10

11 7 1 -4 12 14 15 10 13 15 -14

14 2 15 -10 14 -3 -6 11 -8 -9 3

Expected output:

* Polynomial 1: -14\*x^10 + 15\*x^9 + 13\*x^8 + 10\*x^7 + 15\*x^6 + 14\*x^5 + 12\*x^4 - 4\*x^3 + x^2 + 7\*x + 11
* Polynomial 2: 3\*x^10 - 9\*x^9 - 8\*x^8 + 11\*x^7 - 6\*x^6 - 3\*x^5 + 14\*x^4 - 10\*x^3 + 15\*x^2 + 2\*x + 14
* Sum: -11\*x^10 + 6\*x^9 + 5\*x^8 + 21\*x^7 + 9\*x^6 + 11\*x^5 + 26\*x^4 - 14\*x^3 + 16\*x^2 + 9\*x + 25
* Subtraction: -17\*x^10 + 24\*x^9 + 21\*x^8 - x^7 + 21\*x^6 + 17\*x^5 - 2\*x^4 + 6\*x^3 - 14\*x^2 + 5\*x - 3
* Product: -42\*x^20 + 171\*x^19 + 16\*x^18 - 361\*x^17 + 100\*x^16 - 78\*x^15 - 419\*x^14 + 184\*x^13 - 201\*x^12 + 254\*x^11 - 57\*x^10 + 276\*x^9 + 450\*x^8 + 280\*x^7 + 385\*x^6 + 215\*x^5 + 259\*x^4 - 59\*x^3 + 193\*x^2 + 120\*x + 154
* Degree of Polynomial: 10
* Evaluation of polynomial at x=2: -451
* Derivative: -140\*x^9 + 135\*x^8 + 104\*x^7 + 70\*x^6 + 90\*x^5 + 70\*x^4 + 48\*x^3 - 12\*x^2 + 2\*x + 7
* Integral: -14\*x^11/11 + 3\*x^10/2 + 13\*x^9/9 + 5\*x^8/4 + 15\*x^7/7 + 7\*x^6/3 + 12\*x^5/5 - x^4 + x^3/3 + 7\*x^2/2 + 11\*x
* Definite integration from x=0 to x=1: 327529/13860
* Real roots of Polynomial 1: [-0.972273272528983, 1.96566386075297]