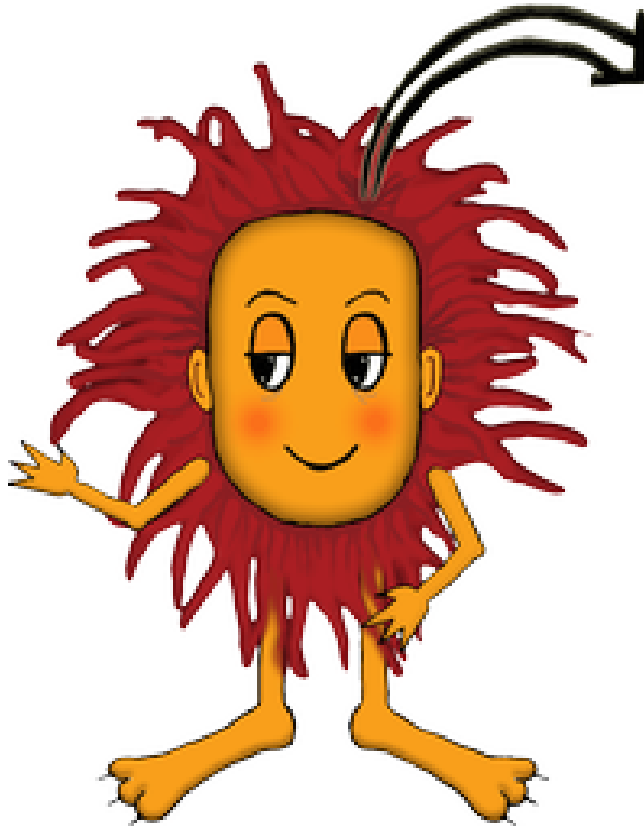


Velika logična pošast



Vrednost polinoma pri kompleksnem argumentu

Dan je polinom $P(x)$ z realnimi koeficienti in kompleksno število z .
Delimo ga s polinomom $(x-z)(x-\bar{z})=x^2-2px-q$
z Ruffini-Hornerjevim postopkom za deljenje s
kvadratnim polinomom. Ostanek je linearna funkcija $R(x)$ in
njena vrednost pri a je vrednost danega polinoma pri a .

1.

$$P(x) = x^3 - 2x^2 + 3x + 1, \quad z = 1 - 3i.$$

2.

$$P(x) = 2x^5 + 2x^4 + 2x^3 + x + 3, z = 3 + i.$$

3.

$$P(x) = 4x^5 - 2x^4 + 2x^3 + 2x^2 + 3x - 2, z = -1 + 3i.$$

4.

$$P(x) = 2x^2 - x - 1, z = -3 + 2i.$$

5.

$$P(x) = 2x^3 + 3x^2 + x + 3, z = -3i.$$

6.

$$P(x) = x^5 + x^4 - x^3 - x^2 - x - 2, z = -1 - 3i.$$

7.

$$P(x) = 3x^4 + x^3 + 3x^2 + 2x + 3, z = 3.$$

8.

$$P(x) = 2x^4 - 2x^3 + 3, z = 2i.$$

9.

$$P(x) = x^4 - 2x^3 + x^2 - 2x, z = -1 + 2i.$$

10.

$$P(x) = 2x^4 - 2x^3 - x^2 + x + 1, z = 1 - 2i.$$

11.

$$P(x) = x^2 + 2x - 2, z = 2 - 2i.$$

12.

$$P(x) = x^3 + 3x^2 - 2x - 1, z = -2 - i.$$

13.

$$P(x) = 4x^3 + 2x^2 + x, z = -2 - 2i.$$

14.

$$P(x) = 3x^5 - x^4 - x^3 - x^2 + 2x + 2, z = 1.$$

15.

$$P(x) = 2x^4 - 2x^3 - 2x^2 + 3, z = -2 + 2i.$$

16.

$$P(x) = x^5 - x^4 + 3x^3 + x^2 - 2x - 1, z = -1.$$

17.

$$P(x) = 3x^4 - 2x^3 - x^2 + 2x, z = -3 - i.$$

18.

$$P(x) = 4x^5 + 2x^4 + 2x^3 - 2x^2 - 2x + 2, z = 3 - 3i.$$

19.

$$P(x) = x^4 + 2x - 1, z = 3i.$$

20.

$$P(x) = 2x^3 + 2x^2 - 1, z = 3 + 2i.$$

21.

$$P(x) = x^5 - x^4 + 2x^3 - x^2 + 3x + 3, z = 3i.$$

22.

$$P(x) = 2x^5 + 2x^4 - 2x^3 + x^2 + 3x, z = -1.$$

23.

$$P(x) = 4x^4 + 3x^3 + 3x^2 - x + 3, z = 2 + i.$$

24.

$$P(x) = 4x^5 - x^4 + x^3 - x + 3, z = -2 + 2i.$$

25.

$$P(x) = x^2, z = 1 + 2i.$$

26.

$$P(x) = 3x^3 + 3x^2 + x + 1, z = 3.$$

27.

$$P(x) = x^2, z = -3 + i.$$

28.

$$P(x) = 4x^3 + 2x^2 - x - 2, z = 2 + i.$$

29.

$$P(x) = 2x^5 - x^4 - x^3 + 2x^2 - 2x + 3, z = -1 + 2i.$$

30.

$$P(x) = 4x^2, z = 1 - 2i.$$

31.

$$P(x) = x^3 + 3x^2 + 2x + 1, z = -3 - 2i.$$

32.

$$P(x) = 3x^4 + 3x^3 + 3x^2 - 2x - 2, z = -3 + 3i.$$

33.

$$P(x) = 4x^2 - 1, z = 0.$$

34.

$$P(x) = 2x^3 + 3x^2 + 3x + 3, z = 1 - 3i.$$

35.

$$P(x) = 2x^3 + x + 3, z = -3 + 3i.$$

36.

$$P(x) = 4x^5 + 2x^4 - 2x^3, z = 1 + 3i.$$

37.

$$P(x) = x^3 - 2x^2 + 2x - 2, z = -3 + i.$$

38.

$$P(x) = x^4 + x^3 - 2x^2 + 3x, z = 3.$$

39.

$$P(x) = 2x^4 + 3x^3 - 2x^2 - x + 2, z = 1 - 2i.$$

40.

$$P(x) = 2x^3 + 3x^2 + x + 3, z = -2i.$$

41.

$$P(x) = 4x^2 - 1, z = 1.$$

42.

$$P(x) = x^3 - x^2 - x - 1, z = 1 + i.$$

43.

$$P(x) = 3x^5 - x^4 - x^3 + 2x^2 + 2x + 1, z = 3 - i.$$

44.

$$P(x) = 3x^2 + 2, z = -1 + i.$$

45.

$$P(x) = 2x^5 + 3x^4 + x^3 + x^2 - 2x + 2, z = -1 + 2i.$$

46.

$$P(x) = 3x^3 + x^2 - 2x, z = 1 + 2i.$$

47.

$$P(x) = 2x^2 - x + 3, z = -3 + 2i.$$

48.

$$P(x) = 2x^2 + x, z = 2 - i.$$

49.

$$P(x) = x^5 + 2x^4 + x^3 + 2, z = -2 - 3i.$$

50.

$$P(x) = 3x^2 - x, z = -1 + i.$$

Rešitve:

1.

$$P(x) = x^3 - 2x^2 + 3x + 1$$

$$z = 1 - 3i$$

$$Q(x) = x^2 - 2x + 10$$

$$p = 1$$

$$q = -10$$

	1	-2	3	1
-10			-10	0
2		2	0	
	1	0	-7	1

$$S(x) = x$$

$$R(x) = 1 - 7x$$

$$P(1 - 3i) = -6 + 21i$$

2.

$$P(x) = 2x^5 + 2x^4 + 2x^3 + x + 3$$

$$z = 3 + i$$

$$Q(x) = x^2 - 6x + 10$$

$$p = 3$$

$$q = -10$$

	2	2	2	0	1	3
-10			-20	-140	-660	-2560
6		12	84	396	1536	
	2	14	66	256	877	-2557

$$S(x) = 2x^3 + 14x^2 + 66x + 256$$

$$R(x) = 877x - 2557$$

$$P(3 + i) = 74 + 877i$$

3.

$$P(x) = 4x^5 - 2x^4 + 2x^3 + 2x^2 + 3x - 2$$

$$z = -1 + 3i$$

$$Q(x) = x^2 + 2x + 10$$

$$p = -1$$

$$q = -10$$

	4	-2	2	2	3	-2
-10			-40	100	180	-1380
-2		-8	20	36	-276	
	4	-10	-18	138	-93	-1382

$$S(x) = 4x^3 - 10x^2 - 18x + 138$$

$$R(x) = -93x - 1382$$

$$P(-1 + 3i) = -1289 - 279i$$

4.

$$P(x) = 2x^2 - x - 1$$

$$z = -3 + 2i$$

$$Q(x) = x^2 + 6x + 13$$

$$p = -3$$

$$q = -13$$

	2	-1	-1
-13			-26
-6		-12	
	2	-13	-27

$$S(x) = 2$$

$$R(x) = -13x - 27$$

$$P(-3 + 2i) = 12 - 26i$$

5.

$$P(x) = 2x^3 + 3x^2 + x + 3$$

$$z = -3i$$

$$Q(x) = x^2 + 9$$

$$p = 0$$

$$q = -9$$

	2	3	1	3
-9			-18	-27
0		0	0	
	2	3	-17	-24

$$S(x) = 2x + 3$$

$$R(x) = -17x - 24$$

$$P(-3i) = -24 + 51i$$

6.

$$P(x) = x^5 + x^4 - x^3 - x^2 - x - 2$$

$$z = -1 - 3i$$

$$Q(x) = x^2 + 2x + 10$$

$$p = -1$$

$$q = -10$$

	1	1	-1	-1	-1	-2
-10			-10	10	90	-270
-2		-2	2	18	-54	
	1	-1	-9	27	35	-272

$$S(x) = x^3 - x^2 - 9x + 27$$

$$R(x) = 35x - 272$$

$$P(-1 - 3i) = -307 - 105i$$

7.

$$P(x) = 3x^4 + x^3 + 3x^2 + 2x + 3$$

$$z = 3$$

$$Q(x) = x^2 - 6x + 9$$

$$p = 3$$

$$q = -9$$

	3	1	3	2	3
-9			-27	-171	-810
6		18	114	540	
	3	19	90	371	-807

$$S(x) = 3x^2 + 19x + 90$$

$$R(x) = 371x - 807$$

$$P(3) = 306$$

8.

$$P(x) = 2x^4 - 2x^3 + 3$$

$$z = 2i$$

$$Q(x) = x^2 + 4$$

$$p = 0$$

$$q = -4$$

	2	-2	0	0	3
-4			-8	8	32
0		0	0	0	
	2	-2	-8	8	35

$$S(x) = 2x^2 - 2x - 8$$

$$R(x) = 8x + 35$$

$$P(2i) = 35 + 16i$$

9.

$$P(x) = x^4 - 2x^3 + x^2 - 2x$$

$$z = -1 + 2i$$

$$Q(x) = x^2 + 2x + 5$$

$$p = -1$$

$$q = -5$$

	1	-2	1	-2	0
-5			-5	20	-20
-2		-2	8	-8	
	1	-4	4	10	-20

$$S(x) = x^2 - 4x + 4$$

$$R(x) = 10x - 20$$

$$P(-1 + 2i) = -30 + 20i$$

10.

$$P(x) = 2x^4 - 2x^3 - x^2 + x + 1$$

$$z = 1 - 2i$$

$$Q(x) = x^2 - 2x + 5$$

$$p = 1$$

$$q = -5$$

	2	-2	-1	1	1
-5			-10	-10	35
2		4	4	-14	
	2	2	-7	-23	36

$$S(x) = 2x^2 + 2x - 7$$

$$R(x) = 36 - 23x$$

$$P(1 - 2i) = 13 + 46i$$

11.

$$P(x) = x^2 + 2x - 2$$

$$z = 2 - 2i$$

$$Q(x) = x^2 - 4x + 8$$

$$p = 2$$

$$q = -8$$

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

$$S(x) = 1$$

$$R(x) = 6x - 10$$

$$P(2 - 2i) = 2 - 12i$$

12.

$$P(x) = x^3 + 3x^2 - 2x - 1$$

$$z = -2 - i$$

$$Q(x) = x^2 + 4x + 5$$

$$p = -2$$

$$q = -5$$

	1	3	-2	-1
-5			-5	5
-4		-4	4	
	1	-1	-3	4

$$S(x) = x - 1$$

$$R(x) = 4 - 3x$$

$$P(-2 - i) = 10 + 3i$$

13.

$$P(x) = 4x^3 + 2x^2 + x$$

$$z = -2 - 2i$$

$$Q(x) = x^2 + 4x + 8$$

$$p = -2$$

$$q = -8$$

	4	2	1	0
-8			-32	112
-4		-16	56	
	4	-14	25	112

$$S(x) = 4x - 14$$

$$R(x) = 25x + 112$$

$$P(-2 - 2i) = 62 - 50i$$

14.

$$P(x) = 3x^5 - x^4 - x^3 - x^2 + 2x + 2$$

$$z = 1$$

$$Q(x) = x^2 - 2x + 1$$

$$p = 1$$

$$q = -1$$

	3	-1	-1	-1	2	2
-1			-3	-5	-6	-6
2		6	10	12	12	
	3	5	6	6	8	-4

$$S(x) = 3x^3 + 5x^2 + 6x + 6$$

$$R(x) = 8x - 4$$

$$P(1) = 4$$

15.

$$P(x) = 2x^4 - 2x^3 - 2x^2 + 3$$

$$z = -2 + 2i$$

$$Q(x) = x^2 + 4x + 8$$

$$p = -2$$

$$q = -8$$

	2	-2	-2	0	3
-8			-16	80	-176
-4		-8	40	-88	
	2	-10	22	-8	-173

$$S(x) = 2x^2 - 10x + 22$$

$$R(x) = -8x - 173$$

$$P(-2 + 2i) = -157 - 16i$$

16.

$$P(x) = x^5 - x^4 + 3x^3 + x^2 - 2x - 1$$

$$z = -1$$

$$Q(x) = x^2 + 2x + 1$$

$$p = -1$$

$$q = -1$$

	1	-1	3	1	-2	-1
-1			-1	3	-8	12
-2		-2	6	-16	24	
	1	-3	8	-12	14	11

$$S(x) = x^3 - 3x^2 + 8x - 12$$

$$R(x) = 14x + 11$$

$$P(-1) = -3$$

17.

$$P(x) = 3x^4 - 2x^3 - x^2 + 2x$$

$$z = -3 - i$$

$$Q(x) = x^2 + 6x + 10$$

$$p = -3$$

$$q = -10$$

	3	-2	-1	2	0
-10			-30	200	-890
-6		-18	120	-534	
	3	-20	89	-332	-890

$$S(x) = 3x^2 - 20x + 89$$

$$R(x) = -332x - 890$$

$$P(-3 - i) = 106 + 332i$$

18.

$$P(x) = 4x^5 + 2x^4 + 2x^3 - 2x^2 - 2x + 2$$

$$z = 3 - 3i$$

$$Q(x) = x^2 - 6x + 18$$

$$p = 3$$

$$q = -18$$

	4	2	2	-2	-2	2
-18			-72	-468	-1548	-828
6		24	156	516	276	
	4	26	86	46	-1274	-826

$$S(x) = 4x^3 + 26x^2 + 86x + 46$$

$$R(x) = -1274x - 826$$

$$P(3 - 3i) = -4648 + 3822i$$

19.

$$P(x) = x^4 + 2x - 1$$

$$z = 3i$$

$$Q(x) = x^2 + 9$$

$$p = 0$$

$$q = -9$$

	1	0	0	2	-1
-9			-9	0	81
0		0	0	0	
	1	0	-9	2	80

$$S(x) = x^2 - 9$$

$$R(x) = 2x + 80$$

$$P(3i) = 80 + 6i$$

20.

$$P(x) = 2x^3 + 2x^2 - 1$$

$$z = 3 + 2i$$

$$Q(x) = x^2 - 6x + 13$$

$$p = 3$$

$$q = -13$$

	2	2	0	-1
-13			-26	-182
6		12	84	
	2	14	58	-183

$$S(x) = 2x + 14$$

$$R(x) = 58x - 183$$

$$P(3 + 2i) = -9 + 116i$$

21.

$$P(x) = x^5 - x^4 + 2x^3 - x^2 + 3x + 3$$

$$z = 3i$$

$$Q(x) = x^2 + 9$$

$$p = 0$$

$$q = -9$$

	1	-1	2	-1	3	3
-9			-9	9	63	-72
0		0	0	0	0	
	1	-1	-7	8	66	-69

$$S(x) = x^3 - x^2 - 7x + 8$$

$$R(x) = 66x - 69$$

$$P(3i) = -69 + 198i$$

22.

$$P(x) = 2x^5 + 2x^4 - 2x^3 + x^2 + 3x$$

$$z = -1$$

$$Q(x) = x^2 + 2x + 1$$

$$p = -1$$

$$q = -1$$

	2	2	-2	1	3	0
-1			-2	2	0	-3
-2		-4	4	0	-6	
	2	-2	0	3	-3	-3

$$S(x) = 2x^3 - 2x^2 + 3$$

$$R(x) = -3x - 3$$

$$P(-1) = 0$$

23.

$$P(x) = 4x^4 + 3x^3 + 3x^2 - x + 3$$

$$z = 2 + i$$

$$Q(x) = x^2 - 4x + 5$$

$$p = 2$$

$$q = -5$$

	4	3	3	-1	3
-5			-20	-95	-295
4		16	76	236	
	4	19	59	140	-292

$$S(x) = 4x^2 + 19x + 59$$

$$R(x) = 140x - 292$$

$$P(2 + i) = -12 + 140i$$

24.

$$P(x) = 4x^5 - x^4 + x^3 - x + 3$$

$$z = -2 + 2i$$

$$Q(x) = x^2 + 4x + 8$$

$$p = -2$$

$$q = -8$$

	4	-1	1	0	-1	3
-8			-32	136	-296	96
-4		-16	68	-148	48	
	4	-17	37	-12	-249	99

$$S(x) = 4x^3 - 17x^2 + 37x - 12$$

$$R(x) = 99 - 249x$$

$$P(-2 + 2i) = 597 - 498i$$

25.

$$P(x) = x^2$$

$$z = 1 + 2i$$

$$Q(x) = x^2 - 2x + 5$$

$$p = 1$$

$$q = -5$$

	1	0	0
-5			-5
2		2	
	1	2	-5

$$S(x) = 1$$

$$R(x) = 2x - 5$$

$$P(1 + 2i) = -3 + 4i$$

26.

$$P(x) = 3x^3 + 3x^2 + x + 1$$

$$z = 3$$

$$Q(x) = x^2 - 6x + 9$$

$$p = 3$$

$$q = -9$$

	3	3	1	1
-9			-27	-189
6		18	126	
	3	21	100	-188

$$S(x) = 3x + 21$$

$$R(x) = 100x - 188$$

$$P(3) = 112$$

27.

$$P(x) = x^2$$

$$z = -3 + i$$

$$Q(x) = x^2 + 6x + 10$$

$$p = -3$$

$$q = -10$$

	1	0	0
-10			-10
-6		-6	
	1	-6	-10

$$S(x) = 1$$

$$R(x) = -6x - 10$$

$$P(-3 + i) = 8 - 6i$$

28.

$$P(x) = 4x^3 + 2x^2 - x - 2$$

$$z = 2 + i$$

$$Q(x) = x^2 - 4x + 5$$

$$p = 2$$

$$q = -5$$

	4	2	-1	-2
-5			-20	-90
4		16	72	
	4	18	51	-92

$$S(x) = 4x + 18$$

$$R(x) = 51x - 92$$

$$P(2 + i) = 10 + 51i$$

29.

$$P(x) = 2x^5 - x^4 - x^3 + 2x^2 - 2x + 3$$

$$z = -1 + 2i$$

$$Q(x) = x^2 + 2x + 5$$

$$p = -1$$

$$q = -5$$

	2	-1	-1	2	-2	3
-5			-10	25	5	-145
-2		-4	10	2	-58	
	2	-5	-1	29	-55	-142

$$S(x) = 2x^3 - 5x^2 - x + 29$$

$$R(x) = -55x - 142$$

$$P(-1 + 2i) = -87 - 110i$$

30.

$$P(x) = 4x^2$$

$$z = 1 - 2i$$

$$Q(x) = x^2 - 2x + 5$$

$$p = 1$$

$$q = -5$$

	4	0	0
-5			-20
2		8	
	4	8	-20

$$S(x) = 4$$

$$R(x) = 8x - 20$$

$$P(1 - 2i) = -12 - 16i$$

31.

$$P(x) = x^3 + 3x^2 + 2x + 1$$

$$z = -3 - 2i$$

$$Q(x) = x^2 + 6x + 13$$

$$p = -3$$

$$q = -13$$

	1	3	2	1
-13			-13	39
-6		-6	18	
	1	-3	7	40

$$S(x) = x - 3$$

$$R(x) = 7x + 40$$

$$P(-3 - 2i) = 19 - 14i$$

32.

$$P(x) = 3x^4 + 3x^3 + 3x^2 - 2x - 2$$

$$z = -3 + 3i$$

$$Q(x) = x^2 + 6x + 18$$

$$p = -3$$

$$q = -18$$

	3	3	3	-2	-2
-18			-54	270	-702
-6		-18	90	-234	
	3	-15	39	34	-704

$$S(x) = 3x^2 - 15x + 39$$

$$R(x) = 34x - 704$$

$$P(-3 + 3i) = -806 + 102i$$

33.

$$P(x) = 4x^2 - 1$$

$$z = 0$$

$$Q(x) = x^2$$

$$p = 0$$

$$q = 0$$

	4	0	-1
0			0
0		0	
	4	0	-1

$$S(x) = 4$$

$$R(x) = -1$$

$$P(0) = -1$$

34.

$$P(x) = 2x^3 + 3x^2 + 3x + 3$$

$$z = 1 - 3i$$

$$Q(x) = x^2 - 2x + 10$$

$$p = 1$$

$$q = -10$$

	2	3	3	3
-10			-20	-70
2		4	14	
	2	7	-3	-67

$$S(x) = 2x + 7$$

$$R(x) = -3x - 67$$

$$P(1 - 3i) = -70 + 9i$$

35.

$$P(x) = 2x^3 + x + 3$$

$$z = -3 + 3i$$

$$Q(x) = x^2 + 6x + 18$$

$$p = -3$$

$$q = -18$$

	2	0	1	3
-18			-36	216
-6		-12	72	
	2	-12	37	219

$$S(x) = 2x - 12$$

$$R(x) = 37x + 219$$

$$P(-3 + 3i) = 108 + 111i$$

36.

$$P(x) = 4x^5 + 2x^4 - 2x^3$$

$$z = 1 + 3i$$

$$Q(x) = x^2 - 2x + 10$$

$$p = 1$$

$$q = -10$$

	4	2	-2	0	0	0
-10			-40	-100	220	1440
2		8	20	-44	-288	
	4	10	-22	-144	-68	1440

$$S(x) = 4x^3 + 10x^2 - 22x - 144$$

$$R(x) = 1440 - 68x$$

$$P(1 + 3i) = 1372 - 204i$$

37.

$$P(x) = x^3 - 2x^2 + 2x - 2$$

$$z = -3 + i$$

$$Q(x) = x^2 + 6x + 10$$

$$p = -3$$

$$q = -10$$

	1	-2	2	-2
-10			-10	80
-6		-6	48	
	1	-8	40	78

$$S(x) = x - 8$$

$$R(x) = 40x + 78$$

$$P(-3 + i) = -42 + 40i$$

38.

$$P(x) = x^4 + x^3 - 2x^2 + 3x$$

$$z = 3$$

$$Q(x) = x^2 - 6x + 9$$

$$p = 3$$

$$q = -9$$

	1	1	-2	3	0
-9			-9	-63	-279
6		6	42	186	
	1	7	31	126	-279

$$S(x) = x^2 + 7x + 31$$

$$R(x) = 126x - 279$$

$$P(3) = 99$$

39.

$$P(x) = 2x^4 + 3x^3 - 2x^2 - x + 2$$

$$z = 1 - 2i$$

$$Q(x) = x^2 - 2x + 5$$

$$p = 1$$

$$q = -5$$

	2	3	-2	-1	2
-5			-10	-35	-10
2		4	14	4	
	2	7	2	-32	-8

$$S(x) = 2x^2 + 7x + 2$$

$$R(x) = -32x - 8$$

$$P(1 - 2i) = -40 + 64i$$

40.

$$P(x) = 2x^3 + 3x^2 + x + 3$$

$$z = -2i$$

$$Q(x) = x^2 + 4$$

$$p = 0$$

$$q = -4$$

	2	3	1	3
-4			-8	-12
0		0	0	
	2	3	-7	-9

$$S(x) = 2x + 3$$

$$R(x) = -7x - 9$$

$$P(-2i) = -9 + 14i$$

41.

$$P(x) = 4x^2 - 1$$

$$z = 1$$

$$Q(x) = x^2 - 2x + 1$$

$$p = 1$$

$$q = -1$$

	4	0	-1
-1			-4
2		8	
	4	8	-5

$$S(x) = 4$$

$$R(x) = 8x - 5$$

$$P(1) = 3$$

42.

$$P(x) = x^3 - x^2 - x - 1$$

$$z = 1 + i$$

$$Q(x) = x^2 - 2x + 2$$

$$p = 1$$

$$q = -2$$

	1	-1	-1	-1
-2			-2	-2
2		2	2	
	1	1	-1	-3

$$S(x) = x + 1$$

$$R(x) = -x - 3$$

$$P(1+i) = -4 - i$$

43.

$$P(x) = 3x^5 - x^4 - x^3 + 2x^2 + 2x + 1$$

$$z = 3 - i$$

$$Q(x) = x^2 - 6x + 10$$

$$p = 3$$

$$q = -10$$

	3	-1	-1	2	2	1
-10			-30	-170	-710	-2580
6		18	102	426	1548	
	3	17	71	258	840	-2579

$$S(x) = 3x^3 + 17x^2 + 71x + 258$$

$$R(x) = 840x - 2579$$

$$P(3 - i) = -59 - 840i$$

44.

$$P(x) = 3x^2 + 2$$

$$z = -1 + i$$

$$Q(x) = x^2 + 2x + 2$$

$$p = -1$$

$$q = -2$$

	3	0	2
-2			-6
-2		-6	
	3	-6	-4

$$S(x) = 3$$

$$R(x) = -6x - 4$$

$$P(-1 + i) = 2 - 6i$$

45.

$$P(x) = 2x^5 + 3x^4 + x^3 + x^2 - 2x + 2$$

$$z = -1 + 2i$$

$$Q(x) = x^2 + 2x + 5$$

$$p = -1$$

$$q = -5$$

	2	3	1	1	-2	2
-5			-10	5	35	-100
-2		-4	2	14	-40	
	2	-1	-7	20	-7	-98

$$S(x) = 2x^3 - x^2 - 7x + 20$$

$$R(x) = -7x - 98$$

$$P(-1 + 2i) = -91 - 14i$$

46.

$$P(x) = 3x^3 + x^2 - 2x$$

$$z = 1 + 2i$$

$$Q(x) = x^2 - 2x + 5$$

$$p = 1$$

$$q = -5$$

	3	1	-2	0
-5			-15	-35
2		6	14	
	3	7	-3	-35

$$S(x) = 3x + 7$$

$$R(x) = -3x - 35$$

$$P(1 + 2i) = -38 - 6i$$

47.

$$P(x) = 2x^2 - x + 3$$

$$z = -3 + 2i$$

$$Q(x) = x^2 + 6x + 13$$

$$p = -3$$

$$q = -13$$

	2	-1	3
-13			-26
-6		-12	
	2	-13	-23

$$S(x) = 2$$

$$R(x) = -13x - 23$$

$$P(-3 + 2i) = 16 - 26i$$

48.

$$P(x) = 2x^2 + x$$

$$z = 2 - i$$

$$Q(x) = x^2 - 4x + 5$$

$$p = 2$$

$$q = -5$$

	2	1	0
-5			-10
4		8	
	2	9	-10

$$S(x) = 2$$

$$R(x) = 9x - 10$$

$$P(2 - i) = 8 - 9i$$

49.

$$P(x) = x^5 + 2x^4 + x^3 + 2$$

$$z = -2 - 3i$$

$$Q(x) = x^2 + 4x + 13$$

$$p = -2$$

$$q = -13$$

	1	2	1	0	0	2
-13			-13	26	52	-546
-4		-4	8	16	-168	
	1	-2	-4	42	-116	-544

$$S(x) = x^3 - 2x^2 - 4x + 42$$

$$R(x) = -116x - 544$$

$$P(-2 - 3i) = -312 + 348i$$

50.

$$P(x) = 3x^2 - x$$

$$z = -1 + i$$

$$Q(x) = x^2 + 2x + 2$$

$$p = -1$$

$$q = -2$$

	3	-1	0
-2			-6
-2		-6	
	3	-7	-6

$$S(x) = 3$$

$$R(x) = -7x - 6$$

$$P(-1 + i) = 1 - 7i$$