

Rozdział 1 - RÓWNANIA KWADRATOWE

Lp.	Równanie	Postać uproszczona	WYNIK
1	$(x-4)^2=(x-4)(2x-1)$	$-x^2+x+12=0$	$Z=\{4,-3\}$
2	$(3x+2)^2=7(3x+2)$	$9x^2-9x-10=0$	$Z=\{-\frac{2}{3},\frac{5}{3}\}$
3	$(x-3)^2+(x-2)^2-(x-1)^2=0$	$x^2-8x+12=0$	$Z=\{2,6\}$
4	$(2x-1)^2-6(2x-1)+5=0$	$2x-1=k \quad k^2-6k+5=0 \quad k_1=1 \text{ lub } k_2=5$	$Z=\{1,3\}$
5	$3x(x+2)+(2x-1)^2=1-5x$	$7x^2+7x=0$	$Z=\{0,-1\}$
6	$(x+1)(x-1)+2x(2x+1)=6x^2$	$-x^2+2x-1=0$	$Z=\{1\}$
7	$(3x-2)^2-x^2-2x=1$	$8x^2-14x+3=0$	$Z=\{\frac{1}{4},\frac{3}{2}\}$
8	$(1-3x)^2+3x-4x^2=9$	$5x^2-3x-8=0$	$Z=\{\frac{8}{5},-1\}$
9	$(2x-3)^2=8x$	$4x^2-20x+9=0$	$Z=\{\frac{1}{2},\frac{9}{2}\}$
10	$(x+1)^2=(x+2)(3-x)-2$	$2x^2+x-3=0$	$Z=\{-\frac{3}{2},1\}$
11	$(4-3x)^2=16-3x^2$	$x^2-2x=0$	$Z=\{0,2\}$
12	$-(-x-\frac{1}{3})^2-(x-\frac{1}{3})(x+\frac{1}{3})=x^2$	$3x^2+\frac{2}{3}x=0$	$Z=\{0,-\frac{2}{9}\}$
13	$(x+4)^2=5(x+14)$	$x^2+3x-54=0$	$Z=\{-9,6\}$
14	$(x+3)^2-(x+4)^2=3x^2$	$3x^2+2x+7=0$	$Z=\emptyset$
15	$(x+1)(x-1)=(x-1)(3-x)$	$x^2-2x+1=0$	$Z=\{1\}$
16	$2x^2+9=(x-4)^2+14x$	$x^2-6x-7=0$	$Z=\{-1,7\}$
17	$(x-4)^2=9-8x$	$x^2+7=0$	$Z=\emptyset$
18	$(x+3)^2=3(2x+6)$	$x^2-9=0$	$Z=\{-3,3\}$
19	$(3x-2)^2=8(x+1)^2-100$	$x^2-28x+96=0$	$Z=\{4,24\}$
20	$(2x-3)^2-(3x-2)^2=5$	$-5x^2=0$	$Z=\{0\}$
21	$(x-2)^2=x+4+2(x-5)(x+5)$	$x^2+5x-50=0$	$Z=\{-10,5\}$
22	$\frac{1}{3}x^2-4\frac{1}{2}x+15=0$	$2x^2-27x+90=0$	$Z=\{6,\frac{15}{2}\}$
23	$2(2-x)^2-(x-2)(5+x)=0$	$x^2-11x+18=0$	$Z=\{2,9\}$
24	$(x+1)^3=(x+1)(x^2-x+2)$	$(x+1)(3x-1)=0$	$Z=\{-1,\frac{1}{3}\}$
25	$(2x-3)^2-3(x^2-3x+4)=7$	$x^2-3x-10=0$	$Z=\{-2,5\}$
26	$2(x+4)^2-5(3x+7)=x^2+3$	$x^2+x-6=0$	$Z=\{-3,2\}$
27	$3x^2-5x+48=2(x+2)^2$	$x^2-13x+40=0$	$Z=\{5,8\}$
28	$(x+3)^2+5x^2=(x-2)^2$	$x^2+2x+1=0$	$Z=\{-1\}$
29	$(x-6)^2+x^2=x^2-17x+30$	$x^2+5x+6=0$	$Z=\{-3,-2\}$
30	$(2x)^2-(x-5)^2=0$	$3x^2+10x-25=0$	$Z=\{-5,\frac{5}{3}\}$
31	$25-(2x+3)^2=0$	$(5-2x-3)(5+2x+3)=0$	$Z=\{-4,1\}$
32	$(x-1)^2-9=0$	$(x-1-3)(x-1+3)=0$	$Z=\{4,-2\}$

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33	$(4x-5)^2=4x^2-9x+5$	$12x^2-31x+20=0$	$Z=\{1\frac{1}{4}, 1\frac{1}{3}\}$
34	$2x^2+9x-5=(2x-1)^2$	$2x^2-13x+6=0$	$Z=\{\frac{1}{2}, 6\}$
35	$49x^2-(2x-5)^2=0$	$(7x-2x+5)(7x+2x-5)=0$	$Z=\{-1, \frac{5}{9}\}$
36	$36x^2-9(x+2)^2=0$	$(6x-3x-6)(6x+3x+6)=0$	$Z=\{-\frac{2}{3}, 2\}$
37	$25(x-1)^2-9(x+2)^2=0$	$(5x-5-3x-6)(5x-5+3x+6)=0$	$Z=\{-\frac{1}{8}, 5\frac{1}{2}\}$
38	$2x^2- x -15=0$	$2x^2+x-15=0$ lub $2x^2-x-15=0$	$Z=\{-3, 3\}$
39	$(x+1)^2-2 x+1 +1=0$	$x^2+4x+4=0$ lub $x^2=0$	$Z=\{-2, 0\}$
40	$ x^2-2x =x^2-2x$		$Z=\{0, 2\}$
41	$ x^2-1 - x-1 =0$		$Z=\{-2, 0, 1\}$
42	$x^2-6 x +5=0$	$x^2+6x+5=0$ lub $x^2-6x+5=0$	$Z=\{-5, -1, 1, 5\}$
43	$x^2+4x+ x+2 =16$	$x^2+3x-18=0$ lub $x^2+5x-14=0$	$Z=\{-6, 2\}$
44	$ x^2-9 =9-x^2$		$Z=\{-3, 3\}$
45	$ x^2-1 + x+1 =0$		$Z=\{-1\}$
46	$\sqrt{2}x^2 + (\sqrt{2}-2)x - 2 = 0$	$\Delta = 4 + 4\sqrt{2} + 2 = (\sqrt{2} + \sqrt{2})^2$	$Z=\{-1, \sqrt{2}\}$
47	$\sqrt{3}x^2 + (\sqrt{3}+1)x + 1 = 0$	$\Delta = 3 + 1 - 2\sqrt{3} = (\sqrt{3} - \sqrt{3})^2$	$Z=\{-1, -\frac{\sqrt{3}}{3}\}$
48	$(4-\frac{3}{x})^2 - 5(4-\frac{3}{x}) + 6 = 0$	$4-\frac{3}{x} = k \quad x \neq 0$	$Z=\{\frac{3}{2}, 3\}$
49	$ x^2-5 =1$	$x^2-5=1$ lub $x^2-5=-1$	$Z=\{\sqrt{6}, -\sqrt{6}, 2, -2\}$
50	$x^2-5 x +4=0$	$x^2+5x+4=0$ lub $x^2-5x+4=0$	$Z=\{-1, -4, 1, 4\}$
51	$2x^2+ x =1$	$2x^2-x-1=0$ lub $2x^2+x-1=0$	$Z=\{\frac{1}{2}, -\frac{1}{2}\}$
52	$\frac{x(\sqrt{x+4})}{2} = \frac{x(\sqrt{x-8})}{4} + 8x$	$x^2-16x=0$	$Z=\{0, 16\}$
53	$(x+4)^2+(x-1)^2=17$	$2x^2+6x=0$	$Z=\{0, -3\}$
54	$(x+5)(x-5)=24$		$Z=\{-7, 7\}$
55	$(x+3)^3=x^3+27$		$Z=\{0, -3\}$
56	$x^3-64=(x-4)^3$		$Z=\{0, 4\}$
57	$3(x-3)^2-(13-x)=3x(x-1)+14+x^2$	$x^2+14x=0$	$Z=\{0, -14\}$
58	$x^3+4x^2+3=x(x-2)^2+7x$	$8x^2-11x+3=0 \quad \Delta=25$	$Z=\{\frac{3}{8}; 1\}$
59	$-4x+8=-3x^2+5x+2$	$x^2-3x+2=0 \quad \Delta=1$	$Z=\{1; 2\}$
60	$(x-1)^2+(x+2)^2=5$	$2x^2+2x=0$	$Z=\{0; -1\}$