Calcule cu nr. reale

$A = 4\cdot\sqrt{48} - 6\cdot\sqrt{12} + 3\sqrt{147} - 2\sqrt{192} + 5\sqrt{27}$

$\sqrt{147} = \sqrt{49\cdot 3} = \sqrt{49}\cdot\sqrt{3} = 7\sqrt{3}$

$\sqrt{48} = \sqrt{16\cdot 3} = \sqrt{2^4\cdot 3} = 2^2\sqrt{3}$

$\sqrt{192} = \sqrt{2^6\cdot 3} = 2^3\sqrt{3} = 8\sqrt{3}$

48 | 2 → 2^2 → 2 ; 12 | 2 → 2^2 → 2 ; 3 | 3 ; 1

48 | 2 → 2 ; 24 | 2 → 2 ; 12 | 2 → 2 ; 6 | 2 → 2 ; 3 | 3 ; 1

12 | 2 → 2 ; 6 | 2 → 2 ; 3 | 3 ; 1

147 | 3 ; 49 | 7 → 7^2 → 7 ; 1

192 | 3 ; 64 | 2 → 2^6 ; 1

$A = 4\cdot 4\cdot\sqrt{3} - 6\cdot 2\sqrt{3} + 3\cdot 7\sqrt{3} - 2\cdot 8\sqrt{3} = 16\sqrt{3} - 12\sqrt{3} + 21\sqrt{3} - 16\sqrt{3} = 9\sqrt{3}$

$B = (5\sqrt{432} - 2\sqrt{75}) : \sqrt{2^2\cdot 5^4}$

$B = (5\cdot 12\sqrt{3} - 2\cdot 5\sqrt{3}) : [2\cdot 5^2]$

$B = (60\sqrt{3} - 10\sqrt{3}) : (2\cdot 25)$

$B = 50\sqrt{3} : (50) = \frac{50\sqrt{3}}{50} = \sqrt{3}$

432 | 2 → 2 ; 216 | 2 → 2 ; 108 | 2 → 2^2 → 2 ; 27 | 3 → 3^2 → 3 ; 3 | 3 ; 1

75 | 3 ; 25 | 5 → 5^2 → 5 ; 1

ATENȚIE:

$50 : (2\cdot 5) = 50 : 10 = 5$

$50 : 2\cdot 5 = 25\cdot 5 = 125$

$\Rightarrow 50 : (2\cdot 5) \neq 50 : 2\cdot 5$

$C = (\sqrt{216} - \sqrt{726}) : \sqrt{6} - (\sqrt{486} - \sqrt{294}) : \sqrt{3}$

216 | 3 ; 72 | 2 → 2^2 → 2 ; 18 | 2 ; 9 | 3 → 3^2 → 3 ; 1

726 | 2 ; 363 | 3 ; 121 | 11 → 11^2 ; 1

486 | 2 ; 243 | 3 ; 81 | 3 → 3^4 → 3^2 ; 1

294 | 2 ; 147 | 3 ; 49 | 7 → 7^2 → 7 ; 1

$C = (6\sqrt{6} - 11\sqrt{6}) : \sqrt{6} - (9\sqrt{6} - 7\sqrt{6}) : \sqrt{3} = -5\sqrt{6} : \sqrt{6} - 2\sqrt{6} : \sqrt{3}$

$C = -\frac{5\sqrt{6}}{\sqrt{6}} - \frac{2\sqrt{6}}{\sqrt{3}} = -5 - \frac{2\sqrt{3}\cdot\sqrt{2}}{\sqrt{3}} = -5 - 2\sqrt{2}$

$\sqrt{6} = \sqrt{3\cdot 2} = \sqrt{3}\cdot\sqrt{2}$

$D = 2\sqrt{3}\cdot 5\sqrt{2} = 2\cdot 5\cdot\sqrt{3}\cdot\sqrt{2} = 10\cdot\sqrt{3\cdot 2} = 10\sqrt{6}$

$E = -3\sqrt{5}\cdot 2\sqrt{7} = -6\sqrt{35}$

Stim că: $a\cdot(b+c) = a\cdot b + a\cdot c$ $\quad a\cdot(b-c) = a\cdot b - a\cdot c$

$3\sqrt{2}\cdot(2\sqrt{3} - 3\cdot\sqrt{2}) = 6\sqrt{6} - 9\cdot 2 = 6\sqrt{6} - 18$

12 | 2^2 → 2 ; 3 | 3 ; 1

75 | 3 ; 25 | 5 → 5^2 → 5 ; 1

50 | 2 ; 25 | 5 → 5 ; 5 | 5 → 5 ; 1

$5\sqrt{12}\cdot(3\sqrt{75} - 2\sqrt{2}) - 2\sqrt{3}\cdot(5\sqrt{50} + 3\sqrt{3}) =$

$= 5\cdot 2\sqrt{3}\cdot(3\cdot 5\sqrt{3} - 2\sqrt{2}) - 2\sqrt{3}\cdot(5\cdot 5\sqrt{2} + 3\sqrt{3}) =$

$= 10\sqrt{3}\cdot(15\sqrt{3} - 2\sqrt{2}) - 2\sqrt{3}\cdot(25\sqrt{2} + 3\sqrt{3}) =$

$= 150\cdot 3 - 20\sqrt{6} - 50\sqrt{6} - 6\cdot 3 = 450 - 70\sqrt{3} - 18 = 432 - 70\sqrt{3}$

Stim ca: $(a+b)\cdot(x+y) = (a+b)\cdot x + (a+b)\cdot y = ax + bx + ay + by$

$(\sqrt{3}+\sqrt{2})\cdot(\sqrt{5}+\sqrt{7}) = \sqrt{15} + \sqrt{21} + \sqrt{10} + \sqrt{14}$

$(\sqrt{7}-\sqrt{3})\cdot(\sqrt{7}+\sqrt{3}) = 7 + \sqrt{21} - \sqrt{21} - 3 = 4$

$a \geq 0 \Rightarrow$

$(\sqrt{a})^2 = \sqrt{a^2} = |a| = a$

$(\sqrt{7})^2 = 7$

$(a+b)\cdot(a-b) = a^2 - ab + ab - b^2 = a^2 - b^2 \Rightarrow$ $\boxed{(a+b)\cdot(a-b) = a^2 - b^2}$

$(\sqrt{131} + \sqrt{130})\cdot(\sqrt{131} - \sqrt{130}) = (\sqrt{131})^2 - (\sqrt{130})^2 = 131 - 130 = 1$

$1997^2 - 1996^2 = (1997 + 1996)\cdot(1997 - 1996) =$

$= 3993\cdot 1 = 3993$

ATENȚIE: $a^2 + b^2 \neq (a+b)^2$

$a^2 - b^2 \neq a^2 - b^2$

$7 = 16 - 9 = 4^2 - 3^2 \neq (4-3)^2 = 1^2 = 1 \Rightarrow$

$4^2 - 3^2 \neq (4-3)^2$

$2001^2 - 2000^2 = (2001 + 2000)\cdot(2001 - 2000) = 4001\cdot 1 = 4001$

$(3\sqrt{2} + 2\sqrt{3} - 5\sqrt{5})\cdot(2\sqrt{3} - 3\sqrt{2}) = 6\sqrt{6} - 9\cdot 2 + 4\cdot 3 - 6\sqrt{6} - 10\sqrt{15} + 15\sqrt{10} =$

$= -18 + 12 - 10\sqrt{15} + 15\sqrt{10} = -6 - 10\sqrt{15} + 15\sqrt{10}$

$(2\sqrt{48} - 5\sqrt{162})\cdot(\sqrt{175} - \sqrt{242} + \sqrt{6}) =$

$= (2\cdot 4\sqrt{3} - 5\cdot 9\sqrt{2})\cdot(5\sqrt{7} - 11\sqrt{2} + \sqrt{6}) =$

$= (8\sqrt{3} - 45\sqrt{2})\cdot(5\sqrt{7} - 11\sqrt{2} + \sqrt{6}) =$

$= 40\sqrt{21} - 88\cdot\sqrt{6} + 8\sqrt{18} - 225\sqrt{14} + 495\cdot 2 - 45\cdot\sqrt{12} =$

48 | $2^2 \to 2$	162 | 2	175 | 5
12 | $2^2 \to 2$	81 | $3^2 \to 3$	35 | 5
3 | 3	1	7 | 7
1		1

242 \| 2
121 \| $11^2 \to 11$
1

$= 40\sqrt{21} - 88\sqrt{6} + 8 \cdot 3\sqrt{2} - 225\sqrt{14} + 990 - 45 \cdot 2\sqrt{3} =$

$= 40\sqrt{21} - 88\sqrt{6} + 24\sqrt{2} - 225\sqrt{14} + 990 - 90\sqrt{3}$

$18\sqrt{3} : (2\sqrt{3}) = \frac{18\sqrt{3}}{2\sqrt{3}} = 9$

$18\sqrt{3} : 2\sqrt{3} = \frac{18\sqrt{3}}{2} \cdot \sqrt{3} = 9 \cdot 3 = 27$

$180 \cdot 4 : (9 \cdot 2) = \frac{180 \cdot 4}{9 \cdot 2} = 40$

$180 \cdot 4 : 9 \cdot 2 = 720 : 9 \cdot 2 = 80 \cdot 2 = 160$

$180 \cdot 4 : 9 \cdot 2 = \frac{180 \cdot 4}{9} \cdot 2 = 20 \cdot 4 \cdot 2 = 160$

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