

Operati cu numere naturale

= Lectia 6 =

1. a) $3 \cdot 45 + 3 \cdot 15 = 3 \cdot (45 + 15) = 3 \cdot 60 = 180$

b) $20 \cdot 48 + 20 \cdot 2 = 20 \cdot (48 + 2) = 20 \cdot 50 = 1000$

c) $28 \cdot 521 - 28 \cdot 21 = 28 \cdot (521 - 21) = 28 \cdot 500 = 14000$

d) $23 \cdot 718 - 162 \cdot 23 = 23 \cdot (718 - 162) = 23 \cdot 556 = 12788$

e) $15 \cdot 38 + 15 \cdot 162 = 15 \cdot (38 + 162) = 15 \cdot 200 = 3000$

f) $702 \cdot 65 + 35 \cdot 702 = 702 \cdot (65 + 35) = 702 \cdot 100 = 70200$

g) $2413 \cdot 1001 - 2413 = 2413 \cdot (1001 - 1) = 2413 \cdot 1000 = 2413000$

2. a) $12 \cdot 13 + 12 \cdot 15 + 12 \cdot 72 = 12 \cdot (13 + 15 + 72) = 12 \cdot 100 = 1200$

b) $125 \cdot 234 - 125 \cdot 28 + 125 \cdot 194 = 125 \cdot (234 - 28 + 194) =$
 $= 125 \cdot (206 + 194) = 125 \cdot 400 = 50000$

c) $702 \cdot 256 - 702 \cdot 55 + 702 \cdot 799 = 702 \cdot (256 - 55 + 799) =$
 $= 702 \cdot (201 + 799) = 702 \cdot 1000 = 702000$

d) $1000 \cdot 372 + 259 \cdot 1000 - 153 \cdot 1000 = 1000 \cdot (372 + 259 - 153) =$
 $= 1000 \cdot (372 + 106) = 1000 \cdot 478 = 478000$

3. $x = 5$; $a + b = 13$

a) $3 \cdot x + 7 \cdot a + 7 \cdot b = 3 \cdot x + 7 \cdot (a + b) = 3 \cdot 5 + 7 \cdot 13 = 15 + 91 = 106$

b) $x \cdot a + x \cdot b - 50 = x \cdot (a + b) - 50 = 5 \cdot 13 - 50 = 65 - 50 = 15$

c) $10 \cdot x + (4 \cdot a + 4 \cdot b) = 10 \cdot x + 4 \cdot (a + b) = 10 \cdot 5 + 4 \cdot 13 = 50 + 52 = 102$

d) $(4 \cdot a + 4 \cdot b - 2 \cdot x) \cdot (2 \cdot a + 2 \cdot b + x) = [4 \cdot (a + b) - 2 \cdot x] \cdot [2 \cdot (a + b) + x] =$
 $= (4 \cdot 13 - 2 \cdot 5) \cdot (2 \cdot 13 + 5) = (52 - 10) \cdot (26 + 5) = 42 \cdot 31 = 1302$

$$4. a) b+c=50 ; a=2$$

$$ab+ac = a \cdot (b+c) = 2 \cdot 50 = 100$$

$$b) x=9 ; y+z=11$$

$$xy+xz+15 = x \cdot (y+z) + 15 = 9 \cdot 11 + 15 = 99 + 15 = 114$$

$$c) a=7 ; b-c=100$$

$$ab-ac = a \cdot (b-c) = 7 \cdot 100 = 700$$

$$d) x=4 ; y+z=100$$

$$5xy+5xz+21 = 5x \cdot (y+z) + 21 = 5 \cdot 4 \cdot 100 + 21 = 20 \cdot 100 + 21 = \\ = 2000 + 21 = 2021$$

$$5. a-b=6 , x=?$$

$$a) x+3 \cdot a - 3 \cdot b = 20$$

$$x+3 \cdot (a-b) = 20$$

$$x+3 \cdot 6 = 20$$

$$x+18 = 20$$

$$x = 20 - 18 \Rightarrow x = 2$$

$$b) x \cdot a - x \cdot b + 9a - 9b = 654$$

$$x \cdot (a-b) + 9 \cdot (a-b) = 654$$

$$x \cdot 6 + 9 \cdot 6 = 654$$

$$x \cdot 6 + 54 = 654$$

$$x \cdot 6 = 654 - 54$$

$$6 \cdot x = 600$$

$$x = 600 : 6 \Rightarrow x = 100$$

$$c) 7 \cdot a - 7 \cdot b + x = 55$$

$$7 \cdot (a-b) + x = 55$$

$$7 \cdot 6 + x = 55$$

$$42 + x = 55$$

$$x = 55 - 42 \Rightarrow x = 13$$

$$d) 13 + x - (5 \cdot a - 5 \cdot b) = 2011$$

$$13 + x - 5 \cdot (a - b) = 2011$$

$$x - 5 \cdot 6 = 2011 - 13$$

$$x - 30 = 1998$$

$$x = 1998 + 30$$

$$x = 2028$$

$$6. a) 10 + 20 + 30 + \dots + 800 = 10 + 2 \cdot 10 + 3 \cdot 10 + \dots + 80 \cdot 10 = \\ = 10 \cdot (1 + 2 + 3 + \dots + 80) = 10 \cdot (1 + 80) \cdot 80 : 2 = 10 \cdot 81 \cdot 40 = \\ = 810 \cdot 40 = 32\ 400$$

$$b) 13 + 26 + 39 + \dots + 715 = 13 + 2 \cdot 13 + 3 \cdot 13 + \dots + 55 \cdot 13 = \\ = 13 \cdot (1 + 2 + 3 + \dots + 55) = 13 \cdot (1 + 55) \cdot 55 : 2 = \\ = 13 \cdot 56 \cdot 55 : 2 = 728 \cdot 55 : 2 = 40\ 040 : 2 = 20\ 020$$

$$c) 21 + 42 + 63 + \dots + 1890 = 21 + 21 \cdot 2 + 21 \cdot 3 + \dots + 21 \cdot 90 = \\ = 21 \cdot (1 + 2 + 3 + \dots + 90) = 21 \cdot (1 + 90) \cdot 90 : 2 = \\ = 21 \cdot 91 \cdot 45 = 1911 \cdot 45 = 85\ 995$$

* (in manual opare 36 in loc de 63)

$$d) 101 + 202 + 303 + \dots + 909 + 1010 + \dots + 9898 + 9999 = \\ = 101 \cdot 1 + 101 \cdot 2 + 101 \cdot 3 + \dots + 101 \cdot 9 + 101 \cdot 10 + \dots + 101 \cdot 98 + 101 \cdot 99 = \\ = 101 \cdot (1 + 2 + 3 + \dots + 9 + 10 + \dots + 98 + 99) = \\ = 101 \cdot (1 + 99) \cdot 99 : 2 = 101 \cdot 100 \cdot 99 : 2 = \\ = 10100 \cdot 99 : 2 = 999\ 900 : 2 = 499\ 950$$

$$7. \overline{ab} = ?$$

$$\overline{ab21} + 7\overline{ab} - 3\overline{ab5} = 3904$$

$$1 + b - 5 = 4 \Rightarrow b = 4 + 5 - 1 \Rightarrow \boxed{b = 8}$$

$$\overline{a821} + 7\overline{a8} - 3\overline{a85} = 3904$$

$$2 + a - 8 = 0 \Rightarrow a = 8 - 2 \Rightarrow \boxed{a = 6}$$

$$\overline{6821} + 7\overline{68} - 3\overline{685} = 3904 \quad (A)$$

$$\overline{ab} = 68$$

Mimikost

$$1. a) 762 \cdot 65 + 35 \cdot 762 = 762 \cdot (65 + 35) = 762 \cdot 100 = 76200$$

$$b) 15 \cdot 348 - 288 \cdot 15 = 15 \cdot (348 - 288) = 15 \cdot 60 = 900$$

$$c) 825 \cdot 175 - 25 \cdot 825 - 825 \cdot 50 = 825 \cdot (175 - 25 - 50) = \\ = 825 \cdot (150 - 50) = 825 \cdot 100 = 82500$$

$$d) 33 \cdot 672 - 33 \cdot 322 - 250 \cdot 33 = 33 \cdot (672 - 322 - 250) = \\ = 33 \cdot (350 - 250) = 33 \cdot 100 = 3300$$

$$2. a) a + b = 20 ; b + c = 30$$

$$3 \cdot a + 7 \cdot b + 4 \cdot c = 3 \cdot a + 3 \cdot b + 4 \cdot b + 4 \cdot c = 3 \cdot (a + b) + 4 \cdot (b + c) = \\ = 3 \cdot 20 + 4 \cdot 30 = 60 + 120 = 180$$

$$b) a + b = 33 ; a + c = 11$$

$$5 \cdot a + 3 \cdot b + 2 \cdot c = \underline{3} \cdot a + \underline{2} \cdot a + \underline{3} \cdot b + \underline{2} \cdot c = 3 \cdot (a + b) + 2 \cdot (a + c) = \\ = 3 \cdot 33 + 2 \cdot 11 = 99 + 22 = 121$$

$$3. a) a \cdot b = 624$$

$$(a + 10) \cdot b = 864$$

$$a \cdot b + 10 \cdot b = 864$$

$$624 + 10 \cdot b = 864$$

$$10 \cdot b = 864 - 624$$

$$10 \cdot b = 240$$

$$b = 240 : 10 \Rightarrow \boxed{b = 24}$$

$$a \cdot 24 = 624$$

$$a = 624 : 24 \Rightarrow \boxed{a = 26}$$

$$R: 24; 26$$

$$b) \quad a \cdot b = 3450$$

$$(a-20) \cdot b = 1950$$

$$a \cdot b - 20 \cdot b = 1950$$

$$3450 - 20 \cdot b = 1950$$

$$20 \cdot b = 3450 - 1950$$

$$20 \cdot b = 1500$$

$$b = 1500 : 20 \Rightarrow \boxed{b = 75}$$

$$a \cdot 75 = 3450$$

$$a = 3450 : 75 \Rightarrow \boxed{a = 46}$$

R: 46, 75

$$4. \quad a, b, c = ?$$

$$a < b < c$$

$$9 \cdot a + 9 \cdot b + 9 \cdot c = 72$$

$$9 \cdot (a + b + c) = 72$$

$$a + b + c = 72 : 9$$

$$a + b + c = 8$$

$$a = 0 \Rightarrow b = 1 \Rightarrow c = 7$$

$$a = 0 \Rightarrow b = 2 \Rightarrow c = 6$$

$$a = 0 \Rightarrow b = 3 \Rightarrow c = 5$$

$$a = 1 \Rightarrow b = 2 \Rightarrow c = 5$$

$$a = 1 \Rightarrow b = 3 \Rightarrow c = 4$$