

## Testul 4

1. a)  $6^4 - 5^4 = 1296 - 625 = 671$

b)  $49^1 - 1^{49} = 49 - 1 = 48$

c)  $45^2 \cdot 2^2 = (45 \cdot 2)^2 = 90^2 = 8100$

d)  $(3^2 \cdot 3)^2 = (3^{2+1})^2 = (3^3)^2 = 3^{3 \cdot 2} = 3^6 = 729$

2. a)  $91^{53} < 91^{62}$ ,  $53 < 62$

b)  $24^{125} > 23^{125}$ ,  $24 > 23$

c)  $19^{34} > 9^{32}$ ,  $19 > 9$  și  $34 > 32$  sau  $(19^{17})^2 > (9^{16})^2$

d)  $2^{55} > 5^{22}$

$$2^{55} = 2^{5 \cdot 11} = (2^5)^{11} = 32^{11}$$

$$5^{22} = 5^{2 \cdot 11} = (5^2)^{11} = 25^{11}$$

3. a)  $12^{55} : 6^{55} : 2^{50} - 7 \cdot 5^0 + 13^2 = (12:6)^{55} : 2^{50} - 7 \cdot 1 + 169 =$   
 $= 2^{55} : 2^{50} - 7 + 169 = 2^{55-50} - 7 + 169 = 2^5 - 7 + 169 =$   
 $= 32 - 7 + 169 = 25 + 169 = 194$

b)  $(2 \cdot 5)^3 + 45^{45} : 9^{45} : 5^{44} - 2000^0 = 10^3 + (45:9)^{45} : 5^{44} - 1 =$   
 $= 1000 + 5^{45} : 5^{44} - 1 = 1000 + 5^{45-44} - 1 = 1000 + 5 - 1 =$   
 $= 1004$

c)  $15^{38} : 5^{38} - (3^{19})^2 = (15:5)^{38} - 3^{19 \cdot 2} = 3^{38} - 3^{38} = 0$

d)  $30^{n+3} : 10^{n+3} - 3^n \cdot 3^3 = (30:10)^{n+3} - 3^{n+3} = 3^{n+3} - 3^{n+3} = 0$

$$4. d = (4^{50} + 4^{49} + 4^{48}) : 21$$

$$d = [4^{48} \cdot (4^2 + 4 + 1)] : 21$$

$$d = [4^{48} \cdot (16 + 5)] : 21$$

$$d = (4^{48} \cdot 21) : 21$$

$$d = 4^{48} \cdot 21^{1-1}$$

$$d = 4^{48} \cdot 21^0 = 4^{48} \cdot 1$$

$$d = 4^{48} = 4^{24 \cdot 2} = (4^{24})^2 = (4^{16})^3$$

$$5. n = 8^{283} + 9^{126}$$

$$u(n) = u(8^{283} + 9^{126}) = u(8^{283}) + u(9^{126}) = u(8^3) + u(9^2) = \\ = 2 + 1 = 3$$

$$8^1 = 8$$

$$8^2 = \dots 4 \quad \Rightarrow 283 : 4 = 70 \text{ rest } 3$$

$$8^3 = \dots 8$$

$$8^4 = \dots 6$$

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$$9^1 = 9$$

$$9^2 = \dots 1 \quad \Rightarrow 126 : 2 = 63 \text{ rest } 0$$

$$9^3 = 9$$

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$$6. [(x + 360 : 4) \cdot 5 + 700] : 600 = 2$$

$$(x + 90) \cdot 5 + 700 = 2 \cdot 600$$

$$(x + 90) \cdot 5 = 1200 - 700$$

$$(x + 90) \cdot 5 = 500$$

$$x + 90 = 500 : 5$$

$$x + 90 = 100$$

$$x = 100 - 90$$

$$\boxed{x = 10}$$