

### Testul 3

1. a)  $7^3 - 5^2 = 343 - 25 = 318$

b)  $477^1 - 0^{20/2} = 477 - 0 = 477$

c)  $15^2 \cdot 2^3 = 225 \cdot 8 = 1800$

d)  $(2^2 \cdot 5)^2 = (4 \cdot 5)^2 = 20^2 = 400$

2. a)  $35^{78} > 35^{68}$ ,  $78 > 68$

b)  $17^{222} < 18^{222}$ ,  $17 < 18$

c)  $32^{32} < 4^{141}$

$$32^{32} = (2^5)^{32} = 2^{5 \cdot 32} = 2^{160}$$

$$4^{141} = (2^2)^{141} = 2^{2 \cdot 141} = 2^{282}$$

d)  $125^9 > 25^{11}$

$$125^9 = (5^3)^9 = 5^{3 \cdot 9} = 5^{27}$$

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

3. a)  $9^{45} : 9^{42} - 2^1 \cdot 3^3 + 20^2 = 9^{45-42} - 2 \cdot 27 + 400 =$

$$= 9^3 - 54 + 400 = 729 - 54 + 400 = 675 + 400 = 1075$$

b)  $4^3 \cdot 5^2 + 225^1 \cdot 12^2 - 54^0 = 64 \cdot 25 + 225 \cdot 144 - 1 =$

$$= 1600 + 32400 - 1 = 34000 - 1 = 33999$$

c)  $3^{17} \cdot 7^{17} - 21^{17} = (3 \cdot 7)^{17} - 21^{17} = 21^{17} - 21^{17} = 0$

d)  $3^{18} \cdot 8^{18} : (6^{16} \cdot 4^{16}) = (3 \cdot 8)^{18} : (6 \cdot 4)^{16} =$

$$= 24^{18} : 24^{16} = 24^{18-16} = 24^2 = 576$$

$$4. C = (2^{40} + 2^{39} + 2^{38}) : 7$$

$$C = [2^{38} \cdot (2^2 + 2^1 + 1)] : 7$$

$$C = 2^{38} \cdot (4 + 2 + 1) : 7$$

$$C = 2^{38} \cdot 7 : 7$$

$$C = 2^{38} \cdot 7^{1-1} = 2^{38} \cdot 7^0 = 2^{38} \cdot 1$$

$$C = 2^{38}$$

$$5. N = 5^{129} + 7^{26}$$

$$u(N) = u(5^{129} + 7^{26}) = u(5^{129}) + u(7^{26}) = u(5^9) + u(7^2) =$$

$$7^1 = 7$$

$$7^2 = 9$$

$$7^3 = 3$$

$$7^4 = 1$$

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$$5^1 = 5$$

$$5^2 = 5$$

$$5^3 = 5$$

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$$\Rightarrow 26 : 4 = 6 \text{ rest } 2$$

$$= 5 + 9 = \dots 4 = \boxed{u(N)} \rightarrow$$

$$6. 1010110_{(2)} = 1 \cdot 2^6 + 1 \cdot 2^4 + 1 \cdot 2^2 + 1 \cdot 2^1 = 64 + 16 + 4 + 2 = 86$$