

Β' ΓΥΜΝΑΣΙΟΥ
ΦΥΛΛΑΔΙΟ ΑΛ.1
(ΔΥΝΑΜΗΣ ΠΗΤΩΝ)

ΔΥΝΑΜΗΣ ΠΗΤΩΝ ΜΕ ΕΚΘΕΤΗ ΦΥΣΙΚΟ

① α) $3^2=9$ β) $(-10)^2=100$ γ) $-5^3=-125$ δ) $(-5)^3=-125$ ε) $-(-3)^3=27$

στ) $-(-\frac{2}{3})^3 = \frac{8}{27}$ ζ) $(-4)^2=16$ θ) $(-2)^5=-32$

② α) $(-2)^4=16$ β) $-2^4=-16$ γ) $(-3)^3=-27$ δ) $-3^3=-27$ ε) $-1^{2004}=-1$

στ) $(-1)^{2014}=1$

③ α) 2^1 β) 3^7 γ) 5^5 δ) $(-2)^7$ ε) $(-6)^6$

④ α) 3 β) 5^2 γ) (-2) δ) a^5 ε) $(-7)^2$

⑤ α) 2^6 β) $(-2)^6$ γ) a^{12} δ) 3^4 ε) $(-3)^6$ στ) $(-2)^{10}$

⑥ α) $(\frac{1}{2})^5$ β) $1^3=1$ γ) $1^7=1$ δ) 2^5 ε) 2^4 στ) $(-2)^3$

⑦ $\frac{(-5)^9 \cdot 2^{10}}{2^9 \cdot 5^7} \neq 2(-5)^2 = \frac{-5^9 \cdot 2^{10}}{5^7 \cdot 2^9} + 2 \cdot 25 = -5^2 \cdot 2 + 2 \cdot 25 = 0$

⑧ $(-7+5)^3 \cdot [-(6-2)^2+3^3] = (-2)^3 [-4^2+3^3] = (-8)[-16+27] = -8 \cdot (11) = -88$

⑨ $A = (-2)^3 + 6 \cdot (-2)^2 + 11 \cdot (-2) + 6 = -8 + 6 \cdot (4) + 11 \cdot (-2) + 6 = -8 + 24 - 22 + 6 = 0$

⑩ $(\frac{1}{2})^2 \cdot \left[-3^2 \cdot \left(\frac{1}{3^2} - \frac{1}{3} \right) + \left(\frac{3}{2} \right)^2 \cdot \frac{4}{9} + 3^3 \right] = \frac{1}{4} \left[-9 \left(\frac{1}{9} - \frac{1}{3} \right) + \frac{9}{4} \cdot \frac{4}{9} + 3^3 \right]$

$= \frac{1}{4} \left[-9 \cdot \left(\frac{1}{9} - \frac{3}{9} \right) + \frac{36}{36} + 3^3 \right] = \frac{1}{4} \left[-9 \left(-\frac{2}{9} \right) + 1 + 27 \right] = \frac{1}{4} \left(\frac{18}{9} + 1 + 27 \right)$

$= \frac{1}{4} (2 + 1 + 27) = \frac{30}{4} = \frac{15}{2}$

⑪ $x = (-2)^2 + 3^3 + (-2)^5 + (-1)^7 = 4 + 27 - 32 - 1 = -2$ Άρα

$A = (x+1)^2 = [(-2)+1]^2 = (-1)^2 = 1$

$B = x^2 + 2x + 1 = (-2)^2 + 2(-2) + 1 = 4 - 4 + 1 = 1$

$\Gamma = (x-1)^2 = (-2-1)^2 = (-3)^2 = 9$

ΔΥΝΑΜΗΣ ΚΑΙ ΕΚΘΕΤΗΣ ΑΡΙΘΜΗΤΙΚΟ

① α) $2^{-5} = \frac{1}{2^5} = \frac{1}{32}$ β) $(-2)^{-5} = \frac{1}{(-2)^5} = \frac{1}{-32}$ γ) $(-3)^{-4} = \frac{1}{(-3)^4} = \frac{1}{81}$

δ) $3^{-4} = \frac{1}{3^4} = \frac{1}{81}$ ε) $(-0,5)^{-2} = \left(-\frac{1}{2}\right)^{-2} = \left(-\frac{2}{1}\right)^2 = 4$

ζ) $0,1^{-4} = \left(\frac{1}{10}\right)^{-4} = \left(\frac{10}{1}\right)^4 = 10000$ η) $(-0,1)^{-4} = \left(-\frac{1}{10}\right)^{-4} = (-10)^4 = 10000$

② α) $\frac{1}{-2^{-4}} = \frac{1}{-\frac{1}{2^4}} = -2^4 = -16$ β) $(-3)^{-3} = \frac{1}{(-3)^3} = \frac{1}{-27}$ γ) $-3^{-3} = -\frac{1}{3^3} = -\frac{1}{27}$

δ) $-1^{-2004} = -\frac{1}{1^{2004}} = -\frac{1}{1} = -1$ ε) $(-1)^{-2004} = \frac{1}{(-1)^{2004}} = \frac{1}{1} = 1$

③ α) 3^{-3} β) 5^{-3} γ) $(-2)^{-2}$ δ) $(-7)^0 = 1$ ε) $\left(-\frac{1}{2}\right)^{-9}$

④ α) $\frac{3^{-6}}{3^{-5}} = 3^{-6-(-5)} = 3^{-1}$ β) 5^{-10} γ) $(-2)^9$ δ) a^5 ε) $(-7)^{-2}$

⑤ α) 2^{-6} β) $(-2)^6$

⑥ α) $1^{-7} = 1$ β) $(-2)^{-3} = \frac{1}{(-2)^3} = \frac{1}{-8}$ γ) $1^{-2004} = 1$ δ) $80^{-4} \cdot \frac{1}{8}$

⑦ α) $3^{-3} = \frac{1}{3^3} = \frac{1}{27}$ β) $(-5)^{-2}$ γ) 1

⑧ Ένα $\left[(a \cdot 3 \cdot b)^{-2} \cdot a^{-5} \cdot b^4 \cdot (a \cdot b^2)^{-3}\right]^{-5} = \left(-\frac{1}{b^5}\right)^{-2} =$
 $= \left(\frac{a^6 \cdot b^{-2} \cdot a^{-5} \cdot b^4 \cdot a^{-3} \cdot b^{-6}}{(-b^5)^2}\right)^{-5} = \frac{(a^{-2} \cdot b^{-4})^{-5}}{b^{10}} = \frac{a^{10} \cdot b^{20}}{b^{10}} = a^{10} \cdot b^{10}$
 $= (a \cdot b)^{10} = \left[2015 \cdot \left(-\frac{1}{2015}\right)\right]^{10} = (-1)^{10} = 1$

⑨ $8 \cdot \left(-\frac{2}{3}\right)^{-3} + (-9)^{-4} \cdot \left(\frac{1}{3}\right)^{-3} \cdot \left(\frac{1}{27}\right)^{-2} = 8 \cdot \left(-\frac{3}{2}\right)^3 + \frac{1}{(-9)^4} \cdot \left(\frac{3}{1}\right)^3 \cdot \left(\frac{27}{1}\right)^2$
 $= 8 \cdot \left(-\frac{27}{8}\right) + \frac{1}{9^4} \cdot \frac{27}{1} \cdot 27^2 =$
 $= -27 + \frac{1}{9 \cdot 9 \cdot 9 \cdot 9} \cdot 27^3 = -27 + \frac{(3^3)^3}{3^2 \cdot 3^2 \cdot 3^2 \cdot 3^2} = -27 + \frac{3^9}{3^8} = -27 + 3 = -24$