Υποδείξεις φυλλαδίο 4

① α) $-5xy^2+3x^2y-2xy^2+2xxy =$
$= -5xy^2+3x^2y-2xy^2+2x^2y =$
$= -5xy^2-2xy^2+3x^2y+2x^2y = -7xy^2+5x^2y$

β) $4ax^2-6ax^2+ax^2 = (4-6+1)ax^2 = -1ax^2 = -ax^2$

γ) $0,3ab-2a+3b-1,2ab+0,3a-b =$
$= 0,3ab-1,2ab-2a+0,3a+3b-b = -0,9ab-1,7a+2b$

δ) $\frac{2}{5}x^2yw+\frac{1}{5}xy^2w-\frac{2}{5}xyxw+3xywy =$

$= \frac{2}{5}x^2yw+\frac{1}{5}xy^2w-\frac{2}{5}x^2yw+3xy^2w =$
$= (\frac{1}{5}+3)xy^2w = \frac{16}{5}xy^2w$

ε) $\left(-\frac{2}{5}xy^3\right)\cdot(-3x^2w)\cdot\left(-\frac{5}{6}yw^3\right) = \left(-\frac{2}{5}\right)(-3)\left(-\frac{5}{6}\right)xx^2y^3ywww^3$
$= -\frac{6}{5}\cdot\frac{5}{6}x^3y^4w^4 = -x^3y^4w^4$

στ) $\frac{(-3x^2y^3)^3}{(-8x^3y^4)} = \frac{(-3)^3(x^2)^3(y^3)^3}{-8\ x^3\ y^4} = \frac{-27x^6y^9}{-8x^3y^4} = \frac{27}{8}x^3y^5$

② $(2x^2-x)-(x^3-5x^2-1) = 2x^2-x-x^3+5x^2+1 =$
$= -x^3+7x^2-x+1$

β) $-3x^2y-(2xy-yx^2)+3xy-y^3 = -3x^2y-2xy+yx^2$
$+3xy-y^3 = -2x^2y+xy-y^3$

γ) $2w^2-(4w-3-(w^2+5w)) = 2w^2-(4w-3-w^2-5w) =$
$= 2w^2-4w+3+w^2+5w = 3w^2+w+3$

d) $\left(\frac{1}{2}x^2-\frac{3}{4}x+1\right)-\left(\frac{1}{6}x+x^2-\frac{1}{3}\right)=$

$\frac{1}{2}x^2-\frac{3}{4}x+1-\frac{1}{6}x-x^2+\frac{1}{3}=$

$\left(\frac{1}{2}-1\right)x^2-\left(\frac{3}{4}+\frac{1}{6}\right)x+1+\frac{1}{3}=$

$-\frac{1}{2}x^2-\frac{11}{12}x+\frac{4}{3}$

e) $4x(2x^2-x+2)-3x=4x2x^2-4x\cdot x+4x\cdot 2-3x=$

$=8x^3-4x^2+8x-3x=8x^3-4x^2+5x$

f) $2xy(x^2-3y^2)-4x(x^2y-2y^3)=2xyx^2-2xy3y^2$

$-4xx^2y-4x(-2y^3)=2x^3y-6xy^3-4x^3y+8xy^3=$

$=2x^3y-4x^3y-6xy^3+8xy^3=-2x^3y+2xy^3$

g) $(2x-3y)(-4x+3y)=2x(-4x)+2x3y-3y(-4x)-3y3y$

$=-8xx+6xy+12yx-9yy=-8x^2+18xy-9y^2$

h) $-3x(x^2-x+1)(x-2)-(x-1)(2x-3)(x+2)=$

$=-3x(x^2x-2x^2-xx+2x+x-2)-(x-1)(2xx+2x^2-3x-3.2)$

$=-3x(x^3-2x^2-x^2+3x-2)-(x-1)(2x^2+2x^2-3x-6)=$

$=-3x(x^3-3x^2+3x-2)-(x-1)(4x^2-3x-6)=$

$=-3x^4+9x^3-9x^2+6x-(4x^3-3x^2-6x-4x^2+3x+6)=$

$=-3x^4+9x^3-9x^2+6x-4x^3+7x^2+3x-6=$

$=-3x^4+5x^3-2x^2+9x-6$

③ Εύρεση ΕΚΠ.

α) $115\alpha xy^3$ $\quad 10\alpha x^2w^2$ $\quad 5y w^2$ | 5 → Το γινόμενο όλων αυτών είναι το ΕΚΠ!

$23\alpha xy^3$ $\quad 2\alpha x^2w^2$ $\quad yw^2$ | 23

αxy^3 $\quad 2\alpha x^2w^2$ $\quad yw^2$ | 2

αxy^3 $\quad \alpha x^2w^2$ $\quad yw^2$ | α

xy^3 $\quad x^2w^2$ $\quad yw^2$ | x

y^3 $\quad xw^2$ $\quad yw^2$ | x

y^3 $\quad w^2$ $\quad yw^2$ | y

y^2 $\quad w^2$ $\quad w^2$ | y^2

1 $\quad w^2$ $\quad w^2$ | w^2

1 $\quad 1$ $\quad 1$ | →

$5 \cdot 23 \cdot 2 \cdot \alpha \cdot x \cdot x \cdot y \cdot y^2 \cdot w^2 = 230\alpha x^2y^3w^2$

Με τον ίδιο τρόπο υπολογίζουμε και τα υπόλοιπα:

β) $24x^2(x+y)^2y^3(x-y)$

γ) x^3-x^2, $(x^2-x)(x^2-1)$, x^3-2x^2+x ⇒

$x^2(x-1)$, $x(x-1)(x-1)(x+1)$, $x(x^2-2x+1)$ →

$x^2(x-1)$, $x(x-1)^2(x+1)$, $x(x-1)^2$ →

ΕΚΠ: $x^2(x-1)^2(x+1)$

$\textcircled{A}^2 - \textcircled{B}^2 \qquad \textcircled{A}+\textcircled{B} \qquad \textcircled{A}-\textcircled{B}$

a) $\dfrac{(2a+1)^2-(a+2)^2}{a^4-1} = \dfrac{(2a+1+a+2)(2a+1-a-2)}{(a^2)^2-1} = \cdot$

$= \dfrac{(3a+3)(a-1)}{(a^2-1)(a^2+1)} = \dfrac{3(a+1)(a-1)}{(a-1)(a+1)(a^2+1)} = \dfrac{3}{a^2+1}$

c) $\dfrac{5x^2-20}{(x-2)^2} = \dfrac{5(x^2-4)}{(x-2)^2} = \dfrac{5(x-2)(x+2)}{(x-2)^2} = \dfrac{5(x+2)}{x-2}$

d) $\dfrac{2y-1}{y+1} \cdot \dfrac{1-2y}{1+y} = \dfrac{2y-1}{y+1} \cdot \dfrac{y+1}{1-2y} = \dfrac{(2y-1)(y+1)}{(y+1)(1-2y)} = -1$

e) $\dfrac{x^2+x}{x^2-4} \cdot \dfrac{x^2+5x+6}{x^2+3x} = \dfrac{x(x+1)(x+2)(x+3)}{(x-2)(x+2)x(x+3)} = \dfrac{x+1}{x-2}$

f) $\dfrac{x-2}{x+1}\,\dfrac{4x+4}{x+2} \cdot \dfrac{8x+8}{x+2} = \dfrac{x-2}{x+1}\,\dfrac{4(x+1)}{x+2} \cdot \dfrac{x+2}{8(x+1)} = \dfrac{x-2}{2(x+1)}$

g) $\dfrac{x-6}{x^2+2x} - \dfrac{4}{x+2} = \dfrac{x-6}{x(x+2)} - \dfrac{4x}{x(x+2)} = \dfrac{x-6-4x}{x(x+2)} = \dfrac{-3(x+2)}{x(x+2)}$

$= -\dfrac{3}{x}$

h) $\dfrac{3x+6}{x^2-4} - \dfrac{4}{2x-4} = \dfrac{3(x+2)}{(x-2)(x+2)} - \dfrac{4\cdot 2}{2(x-2)} =$

$= \dfrac{3-2}{x-2} = \dfrac{1}{x-2}$

i) $\dfrac{1}{x^2} - \dfrac{2}{x^2+1} = \dfrac{x^2+1-2x^2}{x^2(x^2+1)} = \dfrac{1-x^2}{x^2(x^2+1)}$.

j) $\dfrac{\frac{1}{x}-\frac{1}{y}}{\frac{y}{x}-\frac{x}{y}} = \dfrac{\frac{y-x}{xy}}{\frac{y^2-x^2}{xy}} = \dfrac{y-x}{y^2-x^2} = \dfrac{1}{y+x}$

l) $\dfrac{x-2+\frac{1}{x}}{x-\frac{1}{x}} = \dfrac{\frac{x^2-2x+1}{x}}{\frac{x^2-1}{x}} = \dfrac{(x-1)^2}{(x-1)(x+1)} = \dfrac{x-1}{x+1}$