n°1 – Calcul élémentaire, développement, factorisation, fractions, puissances (corrigé)

1. (SF9)

$1^\dagger_{1})\ \dfrac{11}{6}$ $\quad 1^\dagger_{6})\ \dfrac{97}{60}$ $\quad 1_{11})\ \dfrac{30325}{237161}$

$1^\dagger_{2})\ 5$ $\quad 1^\dagger_{7})\ -\dfrac{63}{16}$ $\quad 1_{12})\ -\dfrac{19}{20}$

$1^\dagger_{3})\ -\dfrac{7}{26}$ $\quad 1_{8})\ \dfrac{119}{220}$ $\quad 1_{13})\ \dfrac{569}{210}$

$1^\dagger_{4})\ \dfrac{19}{21}$ $\quad 1_{9})\ \dfrac{5237}{2310}$ $\quad 1^*_{14})\ \dfrac{-1+\sqrt{3}(e+2)}{\sqrt{3}}$

$1^\dagger_{5})\ \dfrac{5}{8}$ $\quad 1_{10})\ \dfrac{31957}{22050}$ $\quad 1^*_{15})\ \dfrac{22-\sqrt{3}+4\pi}{4}$

2. (SF9)

$2^\dagger_{1})\ x^3,\ x^{5/2},\ x^{-1/2}$ $\quad 2^\dagger_{6})\ x^{-47/6}$ $\quad 2^\dagger_{11})\ -\dfrac{1}{4}x^{3/4}$

$2^\dagger_{2})\ x^{-4/3}$ $\quad 2^\dagger_{7})\ x^{-127/30}$ $\quad 2^\dagger_{12})\ \dfrac{1}{2}x^{-34/15}$

$2_{3})\ 1$ $\quad 2_{8})\ x^{-9/2}$ $\quad 2_{13})\ x^{a+b+c-d-e-f},\ a,b,c,d,e,f\in\mathbb{R}$

$2_{4})\ x^8$ $\quad 2_{9})\ x^{-91/21}$ $\quad 2^*_{14})\ 3^{1/5}5^{1/7}7^{1/14}x^{-23162/1575}$

$2_{5})\ x^{-21}$ $\quad 2_{10})\ x^{-65/42}$ $\quad 2^*_{15})\ -3512320\sqrt{11}x^{449/70}$

3. (SF9)

$3^\dagger_{1})\ 2x^2-18$ $\quad 3^\dagger_{6})\ 10x^3+7x^2-4x-1$

$3^\dagger_{2})\ x^2-x-2$ $\quad 3_{7})\ -x^3-\dfrac{9}{2}x^2-\dfrac{7}{2}x+3$

$3_{3})\ 7x^2-8x-\dfrac{33}{7}$ $\quad 3_{8})\ -9x^3-36x^2+\dfrac{1}{4}+1$

$3^\dagger_{4})\ -\dfrac{4}{3}x^2+\dfrac{83}{15}x-2$ $\quad 3_{9})\ \dfrac{14}{15}x^3-\dfrac{13}{15}x^2-\dfrac{31}{15}x+2$

$3_{5})\ -\dfrac{77}{9}x^2+\dfrac{859}{435}x+\dfrac{46}{145}$ $\quad 3_{10})\ -\dfrac{11}{15}x^3+\dfrac{535}{72}x^2-\dfrac{163}{180}x-\dfrac{2}{3}$

puis

$3^{\dagger}_{11})$ $x^4 - 10x^3 + 35x^2 - 50x + 24$

$3^{\dagger}_{12})$ $x^4 + 2x^3 - 13x^2 - 14x + 24$

$3_{13})$ $\dfrac{55}{12}x^4 - \dfrac{5}{6}x^3 - \dfrac{55}{3}x^2 + \dfrac{10}{3}x$

$3_{14})$ $\dfrac{1}{6}x^4 - \dfrac{5}{3}x^3 + \dfrac{37}{6}x^2 - 10x + 6$

$3^{*}_{15})$ $\dfrac{1}{240}x^4 - \dfrac{47}{4320}x^3 + \dfrac{1}{324}x^2 + \dfrac{49}{9720}x - \dfrac{1}{486}$

4. (SF9)

$4^{\dagger}_{1})$ $3x(x-4)$

$4^{\dagger}_{2})$ $\dfrac{2}{3}x(1-x)$

$4^{\dagger}_{3})$ $x(ax+b)$

$4_{4})$ $(x-2)(x^2+4)$

$4_{5})$ $(x+1)(x-1)(x^2+1)$

$4_{6})$ $(x+1)(3x^2+1) - \dfrac{4}{3}$

$4_{7})$ $\left(\dfrac{3}{2}x - 1\right)(2x-1)(2x+1)$

$4_{8})$ $(6x+1)(\dfrac{1}{6}x + \dfrac{1}{9})(x-2)$

$4_{9})$ $\left(\dfrac{1}{3} - x + 1\right)(x+1)(x-2)(x-3)$

$4_{10})$ $x^2(x-3)(x-1)(x+1)$

et puis

$4_{11})$ $\left(x - \sqrt{2}\right)\left(x + \sqrt{2}\right)(x-1)(x+1)(x^2+1)$

$4_{12})$ $(x-2)(x^2+1)\left(x - \sqrt[3]{2}\right)\left(x^2 + \sqrt[3]{2}x + \sqrt[3]{4}\right)$

$4_{13})$ $(ax+b)(cx+d),\ a,b,c,d \in \mathbb{R}$

$4^{*}_{14})$ $(ax+b)(cx+d)(ex+f),\ a,b,c,d,e,f \in \mathbb{R}$

$4^{*}_{15})$ $(x-e)(\pi - x)(x-2)(x+1)$

5. (SF8,SF9)

$5_0^\dagger)$ $x = -\dfrac{a}{b},\ a \in \mathbb{R}, b \in \mathbb{R} \setminus \{0\}$

$5_1^\dagger)$ $x = 3^{3/7}$

$5_2)$ $x = 16^{7/9}$

$5_3)$ $x = \dfrac{a}{4},\ a \in \mathbb{R}$

$5_4^*)$ $\beta = \dfrac{3}{2}\alpha,\ \alpha, \beta, \in \mathbb{R}$

$5_5^*)$ $x = \dfrac{1}{2}$