Correction du Test n° 8

Sujet A

1. Résoudre le système (S) : $\left\{\begin{array}{rcrcrcrl} x & - & 2y & + & z & = & 1 & L_1 \\ -2x & + & 3y & - & 3z & = & -1 & L_2 \\ 3x & + & y & + & z & = & -6 & L_3 \end{array}\right. \Leftrightarrow$

$$\left\{\begin{array}{rcrcrcrl} x & - & 2y & + & z & = & 1 & L_1 \\ & - & y & - & z & = & 1 & L_2+2L_1 \\ & & 7y & - & 2z & = & -9 & L_3-L_1 \end{array}\right. \Leftrightarrow \left\{\begin{array}{rcrcrcrl} x & - & 2y & + & z & = & 1 & L_1 \\ & & y & + & z & = & -1 & -L_2 \\ & & & - & 9z & = & -2 & L_3+7L_2 \end{array}\right.$$

$$\Leftrightarrow \left\{\begin{array}{l} x = -\dfrac{15}{9} = -\dfrac{5}{3} \\ y = -\dfrac{11}{9} \\ z = \dfrac{2}{9} \end{array}\right.$$

2. $f(x) = \dfrac{3}{\sqrt{x}} - \ln x$ sur $I =]0,+\infty[$ $\qquad F(x) = 6\sqrt{x} - x\ln x + x$

$f(x) = \dfrac{2+x^2}{x^2} = \dfrac{2}{x^2} + 1$ sur $I =]0,+\infty[$. $\qquad F(x) = -\dfrac{2}{x} + x$

$f(x) = \dfrac{x}{\sqrt{1+x^2}}$ sur $I = \mathbb{R}$. $\qquad F(x) = \sqrt{1+x^2}$

3. $I = \displaystyle\int_0^\pi 2x\cos x\,\mathrm{d}x$ on pose $u = 2x, v' = \cos x, u' = 2, v = \sin x$ qui sont de classe c^1 sur $[0,\pi]$ et

$I = [2x\sin x]_0^\pi - 2\displaystyle\int_0^\pi \sin x\,\mathrm{d}x$

$I = 0 - 2\,[-\cos x]_0^\pi = 2\,(\cos\pi - \cos 0) = -4$

Correction du Test n° 8

Sujet B

1. (S) : $\left\{\begin{array}{rcrcrcrl} x & + & 2y & - & z & = & 1 & L_1 \\ -2x & - & 3y & + & 3z & = & -1 & L_2 \\ 3x & - & y & - & z & = & -6 & L_3 \end{array}\right. \Leftrightarrow$

$$\left\{\begin{array}{rcrcrcrl} x & + & 2y & - & z & = & 1 & L_1 \\ & & y & + & z & = & 1 & L_2+2L_1 \\ & - & 7y & + & 2z & = & -9 & L_3-3L_1 \end{array}\right. \Leftrightarrow \left\{\begin{array}{rcrcrcrl} x & + & 2y & - & z & = & 1 & L_1 \\ & & y & + & z & = & 1 & -L_2 \\ & & & & 9z & = & -2 & L_3+7L_2 \end{array}\right.$$

$$\Leftrightarrow \left\{\begin{array}{l} x = -\dfrac{15}{9} = -\dfrac{5}{3} \\ y = \dfrac{11}{9} \\ z = -\dfrac{2}{9} \end{array}\right.$$

2. $f(x) = \ln x - \dfrac{2}{\sqrt{x}}$ sur $I =]0, +\infty[$ $\qquad F(x) = x \ln x - x - 4\sqrt{x}$

   $f(x) = \dfrac{x^2 - 2}{x^2} = 1 - \dfrac{2}{x^2}$ sur $I =]0, +\infty[$. $\qquad F(x) = x + \dfrac{2}{x}$

   $f(x) = \dfrac{x}{\sqrt{1 + x^2}}$ sur $I = \mathbb{R}$. $\qquad F(x) = \sqrt{1 + x^2}$

3. $I = \displaystyle\int_0^{\pi} 2x \sin x \,\mathrm{d}x$ on pose $u = 2x, v' = \sin x, u' = 2, v = -\cos x$ qui sont de classe c^1 sur $[0, \pi]$ et

   $I = [-2x \cos x]_0^{\pi} + 2\displaystyle\int_0^{\pi} \cos x \,\mathrm{d}x$

   $I = -2\pi\,(\cos \pi) + 2\,[\sin x]_0^{\pi} = 2\pi$