2.3.26 17.01.19

c) $\underbrace{35x^3 + 47x^2 + 13x + 1}_{p} = 0$ $\frac{1}{35}$

Factorisons p. Les zéros de p rationnels, s'ils existent, apparaissent parmi les nombres suivants :

± 1 ; $\pm \frac{1}{5}$; $\pm \frac{1}{7}$

$p(-1) = -35 + 47 - 13 + 1 = 0$

Divisons p par $x + 1$:

	35	47	13	1
-1		-35	-12	-1
	35	12	1	0

$p = (x+1)\underbrace{(35x^2 + 12x + 1)}_{p_1}$

$$\underbrace{35x^2 + 12x + 1}_{P_1}$$

Factorisons P_1 : $\quad 35x^2 + 12x + 1 = 0$

$$\Delta = 12^2 - 4 \cdot 35 \cdot 1$$
$$= 144 - 140 = 4 = 2^2$$

$$x_1 = \frac{-12 - 2}{70} = \frac{-14}{70} = \frac{-1}{5}$$

$$x_2 = \frac{-12 + 2}{70} = \frac{-10}{70} = \frac{-1}{7}$$

Donc $\quad P_1 = 35\left(x + \frac{1}{5}\right)\left(x + \frac{1}{7}\right)$

$$= (5x + 1)(7x + 1)$$

Finalement, l'équation :

$$(x+1)(5x+1)(7x+1) = 0$$

$$S = \left\{-1 \; ; \; -\frac{1}{5} \; ; \; -\frac{1}{7}\right\}$$

2.4.1 a) c) g) i) n

2.4.2 a) d) h

2.4.3 e) h) j)

2.4.4 a) c) g)

2.4.5 b) d)

2.4.1 Rendre les fractions rationnelles irréductibles :

a) $\dfrac{54a^3b^3}{15a^5b^2}$ b) $\dfrac{-16u^2v^2w^3}{-4u^3vw^2}$ c) $\dfrac{x-1}{2x-2}$

a) $$\frac{\cancel{54}\ a^3\ b^3}{\cancel{15}\ a^5\ b^2} = \frac{18\ b}{5\ a^2}$$

$$\frac{\cancel{3}\cdot 18\ \cancel{a}\cdot\cancel{a}\cdot\cancel{a}\ \cancel{b}\cdot\cancel{b}\ b}{\cancel{3}\cdot 5\ \cancel{a}\cdot\cancel{a}\cdot\cancel{a}\cdot a\cdot a\ \cdot\cancel{b}\cdot\cancel{b}}$$

$$\frac{A^p}{A^q} = \begin{cases} A^{p-q} & , p > q \\ 1 & , p = q \\ \dfrac{1}{A^{q-p}} & , p < q \end{cases}$$

c) $$\frac{x-1}{2x-2} = \frac{\cancel{x-1}}{2(\cancel{x-1})} = \frac{1}{2}$$

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

$= \dfrac{1-x}{x(x+1)}$

i) $\dfrac{x^3-15x^2+75x-125}{x^2-25} = \dfrac{(x-5)^{\cancel{3}\,2}}{\cancel{(x-5)}(x+5)} = \dfrac{(x-5)^2}{x+5}$

2.4.2

h) $\dfrac{6x^2-5x-6}{x^2-4} \div \dfrac{2x^2-3x}{x+2} = \dfrac{6x^2-5x-6}{x^2-4} \cdot \dfrac{x+2}{2x^2-3x}$

$= \dfrac{(3x+2)\cancel{(2x-3)}}{(x-2)\cancel{(x+2)}} \cdot \dfrac{\cancel{x+2}}{x\cancel{(2x-3)}} = \dfrac{3x+2}{x(x-2)}$

$6x^2-5x-6=0$

$\Delta = 25+4\cdot 6\cdot 6 = 169 = 13^2$

$x_1 = \dfrac{5-13}{12} = \dfrac{-2}{3}$; $x_2 = \dfrac{5+13}{12} = \dfrac{3}{2}$

$(3x+2)(2x-3)$