11.01.22

g) $\dfrac{t}{t-2} - \dfrac{2}{t+2} = \dfrac{8}{t^2-4}$

① Recherche de ED :

$t - 2 = 0$ $t = 2$

$t + 2 = 0$ $t = -2$

$t^2 - 4 = 0$

$(t-2)(t+2) = 0$

$t = 2$ $t = -2$

$ED = \mathbb{R} - \{2 ; -2\}$

② dc : $(t-2)(t+2)$

$$\frac{t}{t-2} - \frac{2}{t+2} = \frac{8}{t^2-4} \qquad \cdot \underbrace{(t-2)(t+2)}_{t^2-4}$$

$$t(t+2) - 2(t-2) = 8 \qquad \text{CL}$$

$$t^2 + 2t - 2t + 4 = 8 \qquad \text{CL}$$

$$t^2 + 4 = 8 \qquad -8$$

$$t^2 - 4 = 0$$

$$(t-2)(t+2) = 0$$

$t = 2$ $t = -2$ ces deux solutions ne conviennent pas !

$S = \emptyset$

2.5.12 i

2.5.13 d) et f)

i) $\dfrac{1}{x^2 - x} + \dfrac{5}{x^2 + x} = \dfrac{4}{x^2 - 1}$

(1) Factorisons les trois dénominateurs :

$x^2 - x = x(x-1)$ zéros : 0, 1

$x^2 + x = x(x+1)$ zéros : 0, −1

$x^2 - 1 = (x-1)(x+1)$ zéros : −1, 1

$ED = \mathbb{R} - \{-1; 0; 1\}$

(2) dc : $x(x-1)$, $x(x+1)$, $(x-1)(x+1)$ $\Big\}$ $x(x-1)(x+1)$

$12 = 4 \cdot 3$

$20 = 4 \cdot 5$

$15 = 3 \cdot 5$

dc 60

(3) $\dfrac{1}{x(x-1)} + \dfrac{5}{x(x+1)} = \dfrac{4}{(x-1)(x+1)}$

$x(x-1)(x+1)$

$(x+1) + 5(x-1) = 4x$ CL

$x+1 + 5x - 5 = 4x$ CL

$6x - 4 = 4x$ $-4x + 4$

$2x = 4$ $\div 2$

$x = 2$

(4) $S = \{2\}$

2.5.13

b) $\dfrac{x}{x+3} = \dfrac{x-1}{2x} + \dfrac{1}{4}$

① ED:

$x + 3 = 0$ | $2x = 0$

$x = -3$ | $x = 0$

$ED = \mathbb{R} - \{0; -3\}$

② $\left.\begin{array}{c} x+3 \\ 2x \\ 4 \end{array}\right\}$ $(x+3) \cdot 2x \cdot 4 = 8x(x+3)$

③ $\dfrac{x \cdot 8x}{8x(x+3)} = \dfrac{(x-1)\,4(x+3)}{8x(x+3)} + \dfrac{1 \cdot 2x(x+3)}{8x(x+3)}$

$x \cdot 8x = (x-1) \cdot 4(x+3) + 2x(x+3)$

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

$8x^2 = 4x^2 + 8x - 12 + 2x^2 + 6x$

$2x^2 - 14x + 12 = 0$

$x^2 - 7x + 6 = 0$

$(x-1)(x-6) = 0$

$S = \{1; 6\}$

2.5.14 Résoudre les équations suivantes.

équations irrationnelles

a) $\sqrt{7-x} = x - 5$

$$\sqrt{7-x} = x-5$$

$$\left(\sqrt{7-x}\right)^2 = (x-5)^2$$

$$7-x = x^2-10x+25$$

$$x^2-9x+18=0$$

$$(x-6)(x-3)=0$$

$$x=6 \qquad x=3$$

$(\ )^2$ vérifier les solutions !

$+x-7$

Vérifions ces deux valeurs :

- $\underline{x=6}$ ✓ : $\sqrt{7-6} \overset{?}{=} 6-5$

  $\sqrt{1} = 1$ OK

- $\underline{x=3}$ ✗ : $\sqrt{7-3} \overset{?}{=} 3-5$

  $\sqrt{4} = -2$

  $2 \neq -2$ ne convient pas !

$$S = \{6\}$$

b) $x = 4 + \sqrt{4x - 19}$

$$x - 4 = \sqrt{4x - 19}$$

$$(x-4)^2 = \left(\sqrt{4x-19}\right)^2$$

$$x^2 - 8x + 16 = 4x - 19$$

$$x^2 - 12x + 35 = 0$$

$$(x-7)(x-5) = 0$$

$$x = 7 \qquad x = 5$$

$(\ )^2$ ⚠ vérifier les solution

$-4x + 19$

Vérifions ces deux solutions :

- $\underline{x = 7}$: ✓ $\quad 7 - 4 \overset{?}{=} \sqrt{28 - 19}$

  $3 = \sqrt{9}$ ✓

- $\underline{x = 5}$: ✓ $\quad 5 - 4 = \sqrt{20 - 19}$

  $1 = 1$ ✓

$$S = \{5 ; 7\}$$