f) $\dfrac{x}{x-6} - \dfrac{1}{2} = \dfrac{x}{6} + \dfrac{x+6}{6-x}$

$$\dfrac{x}{x-6} - \dfrac{1}{2} = \dfrac{x}{6} - \dfrac{x+6}{x-6}$$

DC: $\quad 6(x-6)$

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

A finir

2.5. 12

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

$x^2 - x = x(x-1)$

$x^2 + x = x(x+1)$

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

dc : $x(x-1)(x+1)$

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

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

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

$6x - 4 = 4x$

$2x = 4$

$x = 2$ ✓

$S = \{2\}$

e) $\dfrac{z}{z-3} - \dfrac{2}{2-z} = \dfrac{3}{z^2 - 5z + 6}$

- $z - 3$

- $-(z - 2)$

- $z^2 - 5z + 6 = (z - 3)(z - 2)$

$ED = \mathbb{R} - \{2, 3\}$

$$\frac{z}{z-3} + \frac{2}{z-2} = \frac{3}{(z-3)(z-2)}$$

$z(z-2) + 2(z-3) = 3$

$z^2 - 9 = 0$

$(z-3)(z+3) = 0$

$\downarrow \qquad \downarrow$

$z = 3 \qquad z = -3$

solution parasite

$$S = \{-3\}$$

Mercredi   2.5.13

Equations irrationnelles

2.5.14 Résoudre les équations suivantes.

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

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

But : déterminer les éventuelles solutions, puis les vérifier.

a) $\sqrt{7-x} = x-5$ $\qquad$ $(\ )^2$ ⚠ vérifier les solutions

$7-x = x^2 - 10x + 25$ $\qquad$ $+x \; -7$

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

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

$\downarrow$

$x = 6 \qquad x = 3$

Vérification :

$\underline{x=6}$: $\qquad \sqrt{7-6} = 6-5$

$\qquad\qquad\qquad \sqrt{1} = 1 \qquad$ convient

$\underline{x=3}$: $\qquad \sqrt{7-3} = 3-5$

$\qquad\qquad\qquad 2 = -2 \qquad$ ne convient pas

$$S = \{6\}$$

b) $x = 4 + \overset{A}{\underset{}{}} + \overset{B}{\sqrt{4x-19}}$ | -4

$$\boxed{x - 4 = \sqrt{4x - 19}}$$ $(\ )^2$ ⚠️

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

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

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

$$\downarrow \qquad\qquad \downarrow$$

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

Vérif

$x = 7 \ \checkmark : \qquad 7 - 4 = \sqrt{28 - 19}$

$$3 = 3 \quad \checkmark \quad \smiley$$

$x = 5 \ \checkmark : \qquad 5 - 4 = \sqrt{20 - 19}$

$$1 = 1 \quad \smiley$$

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

e) $\sqrt{7-2x} - \sqrt{5+x} = \sqrt{4+3x}$

$$\sqrt{7-2x} = \sqrt{4+3x} + \sqrt{5+x} \quad \Big| \; ()^2 \; \triangle$$

$$7 - 2x = 4 + 3x + 2\sqrt{4+3x} \cdot \sqrt{5+x} + 5+x \quad \Big| \; -4x - 9$$

$$-2 - 6x = 2\sqrt{4+3x} \, \sqrt{5+x} \quad \Big| \; \div 2$$

$$-1 - 3x = \sqrt{4+3x} \, \sqrt{5+x} \quad \Big| \; ()^2$$

$$1 + 6x + 9x^2 = (4+3x)(5+x)$$

$$9x^2 + 6x + 1 = 3x^2 + 19x + 20$$

$$6x^2 - 13x - 19 = 0$$

$$(6x - 19)(x + 1) = 0$$

$$\downarrow \qquad\qquad \downarrow$$

$$x = \frac{19}{6} \qquad\qquad x = -1$$

Vérif $\quad x = -1 \; \checkmark \qquad \sqrt{7+2} = \sqrt{1} + \sqrt{4}$

$$3 = 1 + 2 \; \checkmark$$

$$x = \frac{19}{6} \qquad \text{ne convient pas après calcul} \quad \bigodot$$