64 $\left(\dfrac{1}{x} + \dfrac{1}{x-1}\right)^2 = \dfrac{9}{4}$ $\left[-1;\ 2;\ \dfrac{1}{3};\ \dfrac{2}{3}\right]$

C.E.
$x \neq 0$

$x \neq 1$

$t = \dfrac{1}{x} + \dfrac{1}{x-1}$

$t^2 = \dfrac{9}{4} \implies t = \pm\sqrt{\dfrac{9}{4}} = \pm\dfrac{3}{2}$

1) $t = -\dfrac{3}{2} \implies \dfrac{1}{x} + \dfrac{1}{x-1} = -\dfrac{3}{2}$ $\dfrac{2(x-1)+2x}{2x(x-1)} = \dfrac{-3x(x-1)}{2x(x-1)}$

$2x - 2 + 2x = -3x^2 + 3x$

$3x^2 - 3x + 4x - 2 = 0$ $3x^2 + x - 2 = 0$ $\Delta = 1 + 24 = 25$

$x = \dfrac{-1 \pm 5}{6} = \begin{cases} -1 \\ \dfrac{4}{6} = \dfrac{2}{3} \end{cases}$ $x = -1 \ \lor \ x = \dfrac{2}{3}$

2) $t = \dfrac{3}{2}$ $\dfrac{1}{x} + \dfrac{1}{x-1} = \dfrac{3}{2}$ $\dfrac{2x - 2 + 2x}{2x(x-1)} = \dfrac{3x^2 - 3x}{2x(x-1)}$

$3x^2 - 7x + 2 = 0$ $\Delta = 49 - 24 = 25$

$x = \dfrac{7 \pm 5}{6} = \begin{cases} \dfrac{2}{6} = \dfrac{1}{3} \\ 2 \end{cases}$ $x = \dfrac{1}{3} \ \lor \ x = 2$

Soluz. finale $\implies$ $\boxed{x = -1 \ \lor \ x = \dfrac{2}{3} \ \lor \ x = \dfrac{1}{3} \ \lor \ x = 2}$

dopo controllo C.E.

73 $\quad x^4 - 3x^2 + 2 = 0 \qquad t = x^2$

$$t^2 - 3t + 2 = 0$$

$$\Delta = 9 - 8 = 1 \qquad t = \frac{3 \pm 1}{2} = \begin{cases} 2 \\ 1 \end{cases}$$

$t = 2 \implies x^2 = 2 \implies x = \pm\sqrt{2}$

$t = 1 \implies x^2 = 1 \implies x = \pm 1$

$$\boxed{x = \pm 1 \ \lor \ x = \pm\sqrt{2}}$$

75 $\quad 2x^4 - x^2 - 1 = 0 \qquad x^2 = t$

$$2t^2 - t - 1 = 0$$

$$\Delta = 1 + 8 = 9 \qquad t = \frac{1 \pm 3}{4} = \begin{cases} -\frac{1}{2} \\ 1 \end{cases}$$

$t = -\frac{1}{2} \implies x^2 = -\frac{1}{2} \quad$ IMP. IN $\mathbb{R}$

$t = 1 \implies x^2 = 1 \qquad x = \pm 1 \qquad \boxed{x = \pm 1}$

84 $\quad x^6 + 6x^3 - 7 = 0 \qquad t = x^3$

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

$(t + 7)(t - 1) = 0 \Big\langle \begin{array}{l} t = -7 \implies x^3 = -7 \implies x = \sqrt[3]{-7} = -\sqrt[3]{7} \\ t = 1 \implies x^3 = 1 \implies x = \sqrt[3]{1} = 1 \end{array}$

$$\boxed{x = -\sqrt[3]{7} \ \lor \ x = 1}$$

90 $x^{12} - 10x^6 + 9 = 0$ $t = x^6$

$t^2 - 10t + 9 = 0$

$(t - 1)(t - 9) = 0$

$t = 1 \Rightarrow x^6 = 1 \Rightarrow x = \pm\sqrt[6]{1} = \pm 1$

$t = 9 \Rightarrow x^6 = 9 \Rightarrow x = \pm\sqrt[6]{9} =$

$= \pm\sqrt[6]{3^2} =$

$= \pm\sqrt[3]{3}$

$\boxed{x = \pm 1 \quad \vee \quad x = \pm\sqrt[3]{3}}$