251 $\dfrac{2}{x^2-1} - \dfrac{4}{x^2-3x+2} = \dfrac{1}{3x^2+6x+3}$

$(x-1)(x+1) \qquad (x-1)(x-2) \qquad 3(x+1)^2 \quad \left[-2; -\dfrac{13}{7}\right]$

C.E.

$x \neq \pm 1 \quad x \neq 2$

$$\dfrac{6(x+1)(x-2) - 12(x+1)^2}{3(x-1)(x+1)^2(x-2)} = \dfrac{(x-1)(x-2)}{3(x-1)(x+1)^2(x-2)}$$

$$6\underbrace{(x^2-2x+x-2)}_{-x} - 12(x^2+2x+1) = x^2 \underbrace{- 2x - x}_{-3x} + 2$$

$$6x^2 - 6x - 12 - 12x^2 - 24x - 12 - x^2 + 3x - 2 = 0$$

$$-7x^2 - 27x - 26 = 0$$

$$7x^2 + 27x + 26 = 0 \qquad \triangle = 27^2 - 4\cdot7\cdot26 = 729 - 728 = 1$$

$$x = \dfrac{-27 \pm 1}{14} = \begin{cases} -\dfrac{28}{14} = -2 \\[2mm] -\dfrac{26}{14} = -\dfrac{13}{7} \end{cases}$$

$$\boxed{x = -2 \quad \lor \quad x = -\dfrac{13}{7}}$$

dopo controllo C.E.

250 $\dfrac{(x+1)^2 - 8}{x^2 + 4x + 3} + \dfrac{1-x}{x+1} = 1 - \dfrac{3}{x+1}$ $\quad [-2; 1]$

CE
$x \neq -1$
$x \neq -3$

$(x+1)(x+3)$

$$\dfrac{x^2 + 1 + 2x - 8 + (1-x)(x+3)}{(x+1)(x+3)} = \dfrac{(x+1)(x+3) - 3(x+3)}{(x+1)(x+3)}$$

$$x^2 + 1 + 2x - 8 + x + 3 - x^2 - 3x = x^2 + 3x + x + 3 - 3x - 9$$

$-x^2 - x + 2 = 0 \qquad x^2 + x - 2 = 0$

$$\Delta = 1 + 8 = 9$$

$$x = \dfrac{-1 \pm 3}{2} = \begin{array}{c} -2 \\ 1 \end{array}$$

$$\boxed{x = -2 \ \lor \ x = 1}$$

dopo controllo CE

510 $3x^2 - 4x - 4$ Scompone

1° METODO $P = 3 \cdot (-4) = -12$ $x_1 = -6$
             $S = -4$ $x_2 = +2$

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

2° METODO   RUFFINI $3x^2 - 4x - 4$ $\pm 1 \; \pm 2 \; \pm 4$ divisori del termine noto

$$
\begin{array}{c|cc|c}
 & 3 & -4 & -4 \\
2 & & 6 & 4 \\
\hline
 & 3 & 2 & /\!/
\end{array}
$$

$2 \mapsto 3 \cdot 2^2 - 4 \cdot 2 - 4 = 0$

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

3° METODO   eq. di 2° grado $3x^2 - 4x - 4$

$\triangle = (-4)^2 - 4 \cdot 3 \cdot (-4) = 16 + 48 = 64 > 0$ si può scompone

$3x^2 - 4x - 4 = 0$

$x = \dfrac{4 \pm 8}{6} = \begin{cases} -\dfrac{4}{6} = -\dfrac{2}{3} \\[2mm] \dfrac{12}{6} = 2 \end{cases}$

$3x^2 - 4x - 4 = 3\left(x + \dfrac{2}{3}\right)(x-2) =$
$$= (3x+2)(x-2)$$

514 $6x^2 + x - 2$ Scomporre

Proviamo Ruffini $\pm 1 \pm 2$ Altri tentativi $\pm \frac{1}{2} \pm \frac{1}{3} \pm \frac{2}{3} \pm \frac{1}{6}$

$1 \mapsto 6 + 1 - 2 \neq 0$

$-1 \mapsto 6 - 1 - 2 \neq 0$

$2 \mapsto 24 + 2 - 2 \neq 0$

$-2 \mapsto 24 - 2 - 2 \neq 0$

DENOMINATORI:
divisori del coefficiente
di grado massimo

$6x^2 + x - 2$ $\Delta = 1 + 48 = 49$

$$x = \frac{-1 \pm 7}{12} = \begin{cases} -\frac{8}{12} = -\frac{2}{3} \\ \frac{6}{12} = \frac{1}{2} \end{cases}$$

$$6x^2 + x - 2 = 6\left(x + \frac{2}{3}\right)\left(x - \frac{1}{2}\right) = 3 \cdot 2 \left(x + \frac{2}{3}\right)\left(x - \frac{1}{2}\right) =$$

$$= (3x + 2)(2x - 1)$$

548 $$\dfrac{4x^2 - 1}{2x^2 + 5x - 3} =$$

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

$2x^2 + 5x - 3 = 0 \qquad \triangle = 25 + 24 = 49$

$x = \dfrac{-5 \pm 7}{4} = \begin{cases} -3 \\ \dfrac{1}{2} \end{cases} \qquad 2\left(x + 3\right)\left(x - \dfrac{1}{2}\right) = (x + 3)(2x - 1)$