

Equazioni fratte

$$\frac{3x-1}{2} = 5$$

non fratta

$$\frac{x+3}{x-1} = 5$$

fratte

$$1) \frac{x+3}{x-1} = 5; \quad \frac{x+3}{x-1} - 5 = 0$$

$$\frac{x+3-5(x-1)}{x-1} = 0;$$

$$\frac{x+3-5x+5}{x-1} = 0 \quad \left| \quad \frac{-4x+8}{x-1} = 0 \right.$$

C.E.: $x-1 \neq 0$, $x \neq 1$

Supposto $x \neq 1$, liberiamo dal denominatore.

$$\cancel{(x-1)} \cdot \frac{-4x+8}{\cancel{x-1}} = 0 \cdot \textcircled{(x-1)}$$

$$-4x + 8 = 0 \quad | \quad -4x = -8 \quad | \quad x = 2$$

| ACC.

$$2) \quad \frac{2x+1}{3x} - \frac{1}{3x-x^2} = \frac{6x-5}{9x-27}$$

$$\frac{2x+1}{3x} - \frac{1}{x(3-x)} - \frac{6x-5}{9(x-3)} = 0$$

$$\frac{2x+1}{3x} + \frac{1}{x(x-3)} - \frac{6x-5}{9(x-3)} = 0$$

$$\frac{3(x-3)(2x+1) + 9 - x(6x-5)}{\cancel{9x(x-3)}} = 0$$

$$CE: \quad \cancel{9x(x-3)} \neq 0 \quad \begin{matrix} \nearrow x \neq 0 \\ \rightarrow x \neq 3 \end{matrix}$$

Supposto $x \neq 0$ e $x \neq 3$ liberiamo dal denominatore:

$$(3x-9)(2x+1) + 9 - 6x^2 + 5x = 0$$

$$\cancel{6x^2} + 3x - 18x - \cancel{9} + \cancel{9} - \cancel{6x^2} + 5x = 0$$

$$-10x = 0 ; \quad \underline{x = 0}$$

impossibile

$$3) \left(\frac{6x+2}{x^2-4x+4} + \frac{2}{2x-x^2} \right) \left(1 - \frac{2}{x} \right) = \frac{6x-1}{x^2-2x}$$

$$\left[\frac{6x+2}{(x-2)^2} + \frac{2}{x(2+x)} \right] \left(\frac{x-2}{x} \right) - \frac{6x-1}{x(x-2)} = 0$$

$$\frac{x(6x+2) - 2(x-2)}{x(x-2)^2} \cdot \frac{x-2}{x} - \frac{6x-1}{x(x-2)} = 0$$

$x \neq 2$

$$\frac{6x^2 + 2x - 2x + 4}{x^2(x-2)} - \frac{6x-1}{x(x-2)} = 0$$

$$\frac{6x^2 + 4 - 6x^2 + x}{x^2(x-2)} = 0$$

$$\frac{x+4}{x^2(x-2)} = 0$$

$$C.E.: x^2(x-2) \neq 0$$

$$x^2 \neq 0 \quad x \neq 2$$

$$x \neq 0$$

$$x+4=0, x=-4 \text{ acc.}$$

$$4) f(x) = \frac{2x^3 + 10x + 12x^2}{x^2 + 6x + 5}$$

$$f(-2) = \frac{-16 - 20 + 48}{4 - 12 + 5} = \frac{12}{-3} = -4$$

$$f(-1) = \frac{-2 - 10 + 12}{1 - 6 + 5} = \frac{0}{0} \text{ ind.}$$

$$-1 \notin \text{dom } f \quad -2 \in \text{dom } f$$

$$x^2 + 6x + 5 \neq 0$$

$$(x+5)(x+1) \neq 0$$

$$x \neq -1; x \neq -5 \quad D = \mathbb{R} - \{-1, -5\}$$

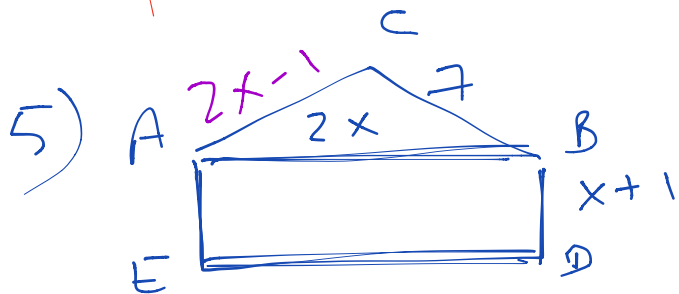
$$f(x) = \frac{2x(x^2 + 6x + 5)}{x^2 + 6x + 5} =$$

$$= \frac{2x \cancel{(x+5)} \cancel{(x+1)}}{\cancel{(x+5)} \cancel{(x+1)}}$$

$$x \neq -5$$

$$x \neq -1$$

$$f(x) = 2x$$



$$\overline{AB} = 2x$$

$$\overline{CB} = 7$$

$$\overline{BD} = x+1$$

$$2\overline{AC} + 8 = 6\overline{BD} - \overline{AB}$$

$$\frac{P(ABC)}{P(AEDB)} = \frac{5}{7}$$

$$\rightarrow \overline{AC} = \frac{6\overline{BD} - \overline{AB} - 8}{2} =$$

$$= \frac{6(x+1) - 2x - 8}{2} = \frac{6x+6-2x-8}{2}$$

$$= \frac{4x-2}{2} = 2x-1$$

$$P(A \cap B \cap C) = 7 + 2x + 2x - 1 = 4x + 6$$

$$\begin{aligned} P(A \cap D \cap B) &= 2(x+1) + 2 \cdot 2x = \\ &= 2x + 2 + 4x = 6x + 2 \end{aligned}$$

$$\frac{4x+6}{6x+2} = \frac{5}{7}$$

$$\frac{2(2x+3)}{2(3x+1)} - \frac{5}{7} = 0$$

$$\frac{14x+21-15x-5}{7(3x+1)} = 0$$

$$\text{C.E. : } x \neq -\frac{1}{3}$$

$$-x = -16, \quad x = 16$$

$$6) \quad x - y = 49 \quad x > y$$
$$\frac{x + y}{2y} = \frac{81}{32} \quad \rightarrow \quad x = y + 49$$

$$\frac{y + 49 + y}{2y} - \frac{81}{32} = 0$$

$$\frac{2y + 49}{2y} - \frac{81}{32} = 0$$

$$\frac{32y + 784 - 81y}{32y} = 0$$

$$\text{C.E. : } 32y \neq 0; \quad y \neq 0$$

$$-49y = -784; \quad y = 16$$

$$x = 49 + 16 = 65$$

$$7) \frac{2x}{|x+3|} = \frac{1}{2}$$

$$x+3 > 0 \quad ; \quad x > -3$$

$$\begin{array}{c} -3 \\ \hline - \quad + \end{array}$$

$$a) \begin{cases} x < -3 \\ \frac{2x}{-x-3} = \frac{1}{2} \end{cases}$$

$$\begin{cases} x < -3 \\ \frac{+2x}{x+3} + \frac{1}{2} = 0 \end{cases}$$

$$\begin{cases} x < -3 \\ \frac{4x+x+3}{2(x+3)} = 0 \\ x \neq -3 \end{cases} \Rightarrow \begin{cases} x < -3 \\ 5x = -3 \end{cases} \Rightarrow \begin{cases} x < -3 \\ x = -\frac{3}{5} \end{cases}$$

non acc.

$$b) \begin{cases} x > -3 \\ \frac{2x}{x+3} - \frac{1}{2} = 0 \end{cases}$$

$$\begin{cases} x > -3 \\ \frac{4x-x-3}{2(x+3)} = 0 \\ x \neq -3 \end{cases}$$

$$\begin{cases} x > -3 \\ 3x = 3 \end{cases} \Rightarrow \begin{cases} x > -3 \\ x = 1 \end{cases} \quad \underline{\text{Acc.}}$$

$$S = \{1\}$$

$$8) \frac{-1-5x^2}{x-x^2-2x^3} - \frac{x-1}{x+x^2} = \frac{3}{2x+1} - \frac{6x}{x-4x^3}$$

$$\frac{5x^2+1}{2x^3+x^2-x} - \frac{x-1}{x^2+x} - \frac{3}{2x+1} + \frac{6x}{+4x^3+x} = 0$$

$$\frac{5x^2+1}{x(2x^2+x-1)} - \frac{x-1}{x(x+1)} - \frac{3}{2x+1} - \frac{6x}{x(4x^2-1)} = 0$$

$x \neq 0$

$$\begin{array}{c|cc|c} -1 & 2 & 1 & -1 \\ & & -2 & 1 \\ & 2 & -1 & // \end{array}$$

$$\frac{5x^2+1}{x(x+1)(2x-1)} - \frac{x-1}{x(x+1)} - \frac{3}{2x+1} - \frac{6}{(2x-1)(2x+1)} = 0$$

$$\frac{(5x^2+1)(2x+1) - (x-1)(2x+1)(2x-1) - 3x(x+1)(2x-1) - 6x(x+1)}{x(x+1)(2x-1)(2x+1)} = 0$$

C.E.: $x \neq 0$; $x \neq -1$; $x \neq \frac{1}{2}$; $x \neq -\frac{1}{2}$

$$10x^3 + 5x^2 + 2x + 1 - (x-1)(4x^2-1) - 3x(2x^2-x+2x-1) +$$

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

$$\cancel{10x^3 + 5x^2 + 2x + 1 - 4x^3 + x + 4x^2 - 1 - 6x^3 + 3x^2 - 6x^2 + 3x} \\ - \cancel{6x^2 - 6x} = 0$$

$$0x = 0$$

$$S = \mathbb{R} - \left\{ -1, -\frac{1}{2}, 0, \frac{1}{2} \right\}$$