Serie 10 - Tecnica di calcolo. **19 febbraio 2016**

1) Equazioni fratte.

213 $\frac{x+5}{5x-x^2}+\frac{x-5}{x^2+5x}=\frac{20}{x^3-25x}$ $[S=\{-1\}]$

214 $\frac{1}{x+8}-\left(\frac{2}{x+2}-\frac{12}{x^2+10x+16}\right)=0$ $[S=\varnothing]$

215 $\frac{4x^2+1-4x}{2x-1}-\frac{4x^2+1+4x}{2x+1}+\frac{2+x}{1-x}=0$ $[S=\{0\}]$

216 $\frac{-3}{x^2+2x}+\frac{2}{x^2-2x}-\frac{10}{x^2-4}=0$ $\left[S=\left\{\frac{10}{11}\right\}\right]$

217 $\frac{3x}{x^2-9}=\frac{5}{9-x^2}-\left(\frac{1}{x^2-3x}-\frac{3}{3+x}\right)$ $\left[S=\left\{-\frac{1}{5}\right\}\right]$

218 $-\frac{8}{x+4}=\frac{x}{2+\frac{x}{2}}-\left(1+\frac{1}{4}\right)\cdot\frac{2^3}{5}$ $[S=R-\{-4\}]$

219 $\frac{2(1-2x)}{x+1}+1=\frac{3x+4}{1-x}+\frac{2(5x+2)}{x^2-1}$ $[S=\varnothing]$

220 $\frac{x-1}{x+3}-\frac{1}{x^2+5x+6}=\frac{x^2+x}{(x+2)^2}\cdot\left(1+\frac{2}{x}\right)$ $[S=\varnothing]$

221 $\frac{2}{x}=\frac{2}{3x+9}-\left(\frac{3-x}{x^2-9}-\frac{5}{3x+x^2}\right)$ $[S=\varnothing]$

2) Equazioni di grado superiore.

442 $(x+1)(25x^2+10x+1)=0$ $3x(x^2-2x+1)=0$ $\left[S=\left\{-1,\ -\frac{1}{5}\right\};\ S=\{0,\ 1\}\right]$

443 $(x-3)(x^2-1)=0$ $(x^2-4)(x+1)=0$ $x^2-4x=0$ $[S=\{3,\ \pm 1\};\ S=\{-1,\ \pm 2\};\ S=\{0,\ 4\}]$

444 $x^2-9=0$ $x^2-6x=0$ $x(x+1)^3=0$ $[S=\{3,-3\};\ S=\{0,\ 6\};\ S=\{-1,\ 0\}]$

445 $x^3-4x=0$ $2x^3-4x^2=0$ $20-x-x^2=0$ $[S=\{0,\ \pm 2\};\ S=\{0,\ 2\};\ S=\{-5,\ 4\}]$

446 $3x^2-7x+2=0$ $4x^2-7x-2=0$ $12x^2-3x=0$ $\left[S=\left\{\frac{1}{3},\ 2\right\};\ S=\left\{-\frac{1}{4},\ 2\right\};\ S=\left\{0,\ \frac{1}{4}\right\}\right]$

447 $8x^3+12x^2-2x-3=0$ $3x^3-4x^2-3x+4=0$ $\left[S=\left\{-\frac{3}{2},-\frac{1}{2},\ \frac{1}{2}\right\};\ S=\left\{\pm 1,\ \frac{4}{3}\right\}\right]$

3) Disequazioni di primo grado.

53 $\left(\frac{x}{3}-1\right)\left(1+\frac{x}{3}\right)+x-2>\frac{x(x+9)}{9}$ $[S=\varnothing]$

54 $\frac{x-1}{5}-\frac{3x^2+1}{4}>-x(x-2)+\frac{1}{4}x^2$ $\left[x<-\frac{1}{4}\right]$

55 $\frac{2x-1}{3}+\frac{2(x+3)}{5}\leq\frac{1}{3}(x-4)$ $[x\leq -3]$

56 $\frac{x+1}{3}+\frac{3x-2}{4}\geq\frac{1}{2}(x-2)+\frac{2x-5}{12}$ $[x\geq\ 3]$

4) Sistemi di disequazioni.

190 $\begin{cases} x-(1-x)(2x+1)<2(x^2-2) \\ \frac{x}{3}-1>\frac{2x+1}{6}-x \end{cases}$ $[S=\varnothing]$

191 $\begin{cases} \frac{x+1}{3}-\frac{x-2}{2}-5\geq 0 \\ \frac{x-3}{2}+\frac{x+1}{5}\leq \frac{1}{2}(x+3) \end{cases}$ $[x\leq -22]$

192 $\begin{cases} \frac{-x+5}{4}-\frac{x-1}{3}>-\frac{x-3}{2} \\ \frac{1}{3}(x+7)-1<\frac{1}{3}x+4 \end{cases}$ $[x<1]$

5) Disequazioni di grado superiore.

123 $x^2+3x>0$ $\quad 5x-x^2\geq 0$ $\quad [x<-3 \vee x>0;\ 0\leq x\leq 5]$

124 $(x+1)(x-2)\leq 0$ $\quad (x+3)(x+7)\geq 0$ $\quad [-1\leq x\leq 2;\ x\leq -7 \vee x\geq -3]$

125 $9(x-1)(x+2)>0$ $\quad x^2+8x+7\leq 0$ $\quad [x<-2 \vee x>1;\ -7\leq x\leq -1]$

126 $2(3-x)(x-4)\leq 0$ $\quad x^2+5x+6\leq 0$ $\quad [x\leq 3 \vee x\geq 4;\ -3\leq x\leq -2]$

127 $x^2+10x+21\geq 0$ $\quad 2x^2+x-1<0$ $\quad \left[x\leq -7 \vee x\geq -3;\ -1<x<\frac{1}{2}\right]$

6) Le disequazioni fratte.

78 $\frac{2x-3}{x+1}<\frac{1}{2}$ $\quad \frac{x-1}{x}>0$ $\quad \left[-1<x<\frac{7}{3};\ x<0 \vee x>1\right]$

79 $\frac{x+2}{x-1}<0$ $\quad \frac{x-3}{x+1}\geq 0$ $\quad [-2<x<1;\ x<-1 \vee x\geq 3]$

80 $\frac{3x-1}{x-7}>3$ $\quad \frac{x-2}{x+5}-1>0$ $\quad [x>7;\ x<-5]$

81 $\frac{x+3}{x-1}>4$ $\quad \frac{x+5}{2-2x}\geq 1$ $\quad \left[1<x<\frac{7}{3};\ -1\leq x<1\right]$

7) Risolvi i seguenti sistemi d'equazioni.

58 $\begin{cases} x+\frac{x-y}{2}=\frac{3}{2}(y-x)+4 \\ \frac{1}{2}(2x-y+6)=x-2y \end{cases}$ $[S=\{(0,-2)\}]$

59 $\begin{cases} \frac{x+7y+1}{5}-\frac{4x-2}{2}=-\frac{9}{5} \\ \frac{x-4y+21}{10}+\frac{2x+3}{5}=-\frac{1}{10}y \end{cases}$ $[S=\{(-3,4)\}]$