Tutorato Analisi 1

Ing. Edile - Architettura 16/17

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13/10/2016 - Equazioni e disequazioni
Esercizi aggiuntivi (non risolti)

a) Risolvere le seguenti equazioni:

1. $2\log_5(x)=3$ $\quad[C.E: x>0,\ x=5^{3/2}]$
2. $\ln(x)-\ln(x+2)=\ln(3)$ $\quad$[impossibile]
3. $2[\ln(x)]^2+\ln(x^4)+2=0$ $\quad[C.E: x>0,\ x=\frac{1}{e}]$
4. $\log_2\left[\sqrt{x^3-2x^2+x}\right]=1+\log_2(x-1)$ $\quad[C.E: x>1,\ x=4]$
5. $\log_3(x+1)+\log_3(x^2)=\log_3(5x-3)$ $\quad[C.E: x>\frac{3}{5},\ x=1]$
6. $\log_9(x)+\log_{27}(x)=\frac{5}{6}$ $\quad[C.E: x>0,\ x=3]$
7. $3^{x+4}=9$ $\quad[x=-2]$
8. $e^x+e^{x+1}=e^2$ $\quad[x=\ln\left(\frac{e^2}{1+e}\right)]$
9. $e^{2x}+e^x-2=0$ $\quad[x=0]$
10. $5^{2x}-5^{x+1}+6=0$ $\quad[x=\log_5 2 \vee x=\log_5 3]$
11. $\frac{e^{3x^3}\cdot e^3}{e^{2x}}=e^{2x^2+x+1}$ $\quad[x=1\vee x=-1\vee x=\frac{2}{3}]$
12. $\left(\frac{1}{\pi}\right)^{-2x^2}-\pi^{x^3-x}=0$ $\quad[x=0\vee x=1\pm\sqrt{2}]$
13. $\sqrt{x}+x=6$ $\quad[x=4]$
14. $\sqrt{3-x}=1-x$ $\quad[x=-1]$
15. $\sqrt{4x-3}=\sqrt{6x-1}$ $\quad$[impossibile]
16. $\sqrt{5x+1}+\sqrt{x+1}-6=0$ $\quad[x=3]$
17. $\sqrt{x-1}+\frac{1}{\sqrt{x-1}}=\frac{x}{\sqrt{x-1}}$ $\quad[x>1]$
18. $\frac{2}{2-x}+\frac{2x}{2+x}+\frac{2}{x^2-4}=0$ $\quad[x=\frac{3\pm\sqrt{13}}{2}]$
19. $\frac{2}{x^2+2x}-\frac{1}{x}+\frac{x}{x+2}=0$ $\quad[x=1]$

20. $\dfrac{\log(10-x)}{\log(4-x)}=2$ $[x=1]$

21. $\dfrac{3^{2-x}-3^{1-x}}{9^{x+1}-3^{2x+1}}=27^{1+3x}$ $[x=-\dfrac{1}{4}]$

b) Risolvere le seguenti disequazioni:

1. $\dfrac{1}{2x-1}<\dfrac{1}{x^2}$ $[(-\infty,0)\cup\left(0,\dfrac{1}{2}\right)]$
2. $\dfrac{12}{2x-7}+x+\dfrac{3}{2}>0$ $[\dfrac{1}{2}<x<\dfrac{3}{2}\vee x>\dfrac{7}{2}]$
3. $\sqrt{1+2x}+\sqrt{x+5}>6$ $[x>4]$
4. $\sqrt{x-1}\le\sqrt[3]{x\sqrt{x}+1}$ $[x\ge 1]$
5. $\dfrac{e^{3x}+4e^{x}}{e^{x}-1}<0$ $[x<0]$
6. $x^{\sqrt{x}}\le\left(\sqrt{x}\right)^{x}$ $[0<x\le 1\vee x\ge 4]$
7. $2\ln(x)-3<\dfrac{2\ln(x)+3}{\ln(x)}$ $[0<x<\dfrac{1}{\sqrt{e}}\vee 1<x<e^{3}]$
8. $\ln^{3}(x)-2\ln(x)\ge 0$ $[e^{-\sqrt{2}}\le x\le 1\vee x\ge e^{\sqrt{2}}]$