14/3/2018 ESERCIZI VARI
EQ. LOGARITMICHE

PAG. 451

384 $\log_3(x+1) = 2\log_9(x^2+9) - 2$

C.E.
$\begin{cases} x+1>0 \\ x^2+9>0 \end{cases} \Rightarrow \boxed{x>-1}$
$\uparrow \forall x$

$$\log_3(x+1) = 2\frac{\log_3(x^2+9)}{\log_3 9} - 2\cdot\log_3 3$$

$$\log_3(x+1) = \cancel{2}\frac{\log_3(x^2+9)}{\cancel{2}} - \log_3 3^2$$

$$\log_3(x+1) = \log_3(x^2+9) - \log_3 9$$

$$\log_3(x+1) = \log_3 \frac{x^2+9}{9}$$

$$x+1 = \frac{x^2+9}{9}$$

$$9x+\cancel{9} = x^2+\cancel{9}$$

$$x^2 - 9x = 0 \qquad x(x-9) = 0 \begin{cases} x=0 \\ x=9 \end{cases}$$

ENTRAMBE ACCETTABILI

$$\boxed{x=0 \ \vee \ x=9}$$

386 $\dfrac{3}{\log_2 x(1+\log_2 x)} = 2 - \dfrac{3}{\log_2 x}$

C.E. $x > 0$

$\log_2 x = t$

$t \neq 0 \to \log_2 x \neq 0 \quad x \neq 1$

$t \neq -1 \to \log_2 x \neq -1$

$x \neq 2^{-1} = \frac{1}{2}$

$x > 0 \wedge x \neq 1 \wedge x \neq \frac{1}{2}$

$$\frac{3}{t(1+t)} = 2 - \frac{3}{t}$$

$$\frac{3}{t(1+t)} = \frac{2t(1+t) - 3(1+t)}{t(1+t)}$$

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

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

$$t = \frac{1 \pm \sqrt{1+48}}{4} = \frac{1 \pm \sqrt{49}}{4} = \frac{1 \pm 7}{4} = \begin{cases} -\frac{6}{4} = -\frac{3}{2} \\ 2 \end{cases}$$

$\log_2 x = -\frac{3}{2} \quad x = 2^{-\frac{3}{2}} = \frac{1}{2^{\frac{3}{2}}} = \frac{1}{\sqrt{2^3}} = \frac{1}{2\sqrt{2}}$

$\log_2 x = 2 \quad x = 4$

entrambe acc.

$x = \frac{1}{2\sqrt{2}} \vee x = 4$