Pag 660 e seguenti

327 : $\log(10-x^2) - \log 8 = 2\log\frac{x}{5} - 2\log\frac{\sqrt{2}}{5}$

C.E. $\begin{cases} 10-x^2 > 0 \\ \frac{x}{5} > 0 \end{cases}$

$\log\left(\frac{10-x^2}{8}\right) = 2 \cdot \log\left(\frac{\frac{x}{5}}{\frac{\sqrt{2}}{5}}\right)$

$\log\left(\frac{10-x^2}{8}\right) = \log\left[\left(\frac{x}{\sqrt{2}}\right)^2\right]$ iniet

$\frac{10-x^2}{8} = \frac{x^2}{2}$ ⟿ $10-x^2 = 4x^2$ ⟿ $5x^2 = 10$ $x^2 = 2$

⟿ $x = \pm\sqrt{2}$ Accett. col +

$\boxed{x = \sqrt{2}}$

384 : $\log(x+1) - \log(\sqrt{x+1}) = 2$

C.E. $\begin{cases} x+1 > 0 \\ \sqrt{x+1} > 0 \\ x+1 > 0 \end{cases}$

$\log\left(\frac{x+1}{\sqrt{x+1}}\right) = \log 100$ iniet

$\frac{x+1}{\sqrt{x+1}} = 100$ ⟿ elevo alla 2

$\frac{(x+1)^2}{(x+1)} = 10000$ ⟿ $\boxed{x = 9999}$ Acc.

457 : $\log_{\frac{4}{5}}(2-x^2) < \log_{\frac{4}{5}}(1-2x)$

C.E. $\begin{cases} 2-x^2 > 0 \\ 1-2x > 0 \end{cases}$

iniet

$2-x^2 \boxed{>} 1-2x$ base compresa tra 0 e 1 si inverte il segno

$-x^2+2x+1 > 0$
$x^2-2x-1 < 0$ $\Delta = 4+4 = 8$ $\sqrt{\Delta} = 2\sqrt{2}$

$\begin{cases} x^2 < 2 \\ x < \frac{1}{2} \end{cases}$ $\begin{cases} -\sqrt{2} < x < \sqrt{2} \\ x < \frac{1}{2} \end{cases}$

$x_1, x_2 = \frac{2 \pm 2\sqrt{2}}{2} < \begin{array}{l} 1+\sqrt{2} \\ 1-\sqrt{2} \end{array}$ $1-\sqrt{2} < x < 1+\sqrt{2}$
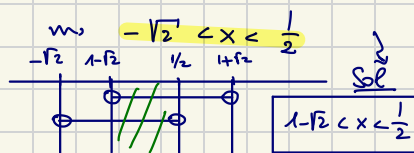
⟿ $-\sqrt{2} < x < \frac{1}{2}$

$-\sqrt{2}$ $1-\sqrt{2}$ $\frac{1}{2}$ $1+\sqrt{2}$

Sol $\boxed{1-\sqrt{2} < x < \frac{1}{2}}$

491: $\log_{\frac{2}{3}} x^5 - \log_{\frac{2}{3}} x < 8$

$5\log_{\frac{2}{3}} x - \log_{\frac{2}{3}} x < 8$

$4\log_{\frac{2}{3}} x < 8$

$\log_{\frac{2}{3}} x < 2 \quad \leadsto \quad \log_{\frac{2}{3}} x < \log_{\frac{2}{3}} \frac{4}{9} \quad \leadsto \quad \boxed{x > \frac{4}{9}}$

$\leadsto \quad \underline{\text{Sol}}: \quad \boxed{x > \frac{4}{9}}$

CE. $\begin{cases} x^5 > 0 \\ x > 0 \end{cases}$

$\begin{cases} x > 0 \\ x > 0 \end{cases} \leadsto \boxed{x > 0}$

514: $\ln x + \dfrac{2}{\ln x} - 3 \le 0$

$\dfrac{\ln^2(x) + 2 - 3\ln x}{\ln x} \le 0$

CE. $\begin{cases} x > 0 \\ \ln x \ne 0 \end{cases}$

$\begin{cases} x > 0 \\ x \ne 1 \end{cases}$

$N \ge 0 \qquad \ln^2 x - 3\ln x + 2 \ge 0 \qquad \ln x = t$

$t^2 - 3t + 2 \ge 0 \qquad \Delta = 1$

$t = \dfrac{3 \mp 1}{2} = \begin{matrix} 2 \\ 1 \end{matrix}$

$t \le 1 \quad \vee \quad t \ge 2 \qquad \ln x \le 1 \quad \vee \quad \ln x \ge 2$

$x \le e \quad \vee \quad x \ge e^2$

$D > 0 \qquad \ln x > 0 \qquad \leadsto \boxed{x > 1}$

$\boxed{\begin{array}{c} x < 1 \quad \vee \\ e \le x \le e^2 \end{array}}$

CE.
Sol
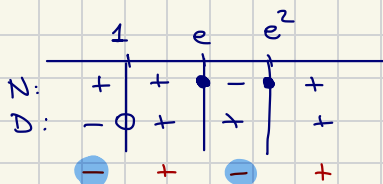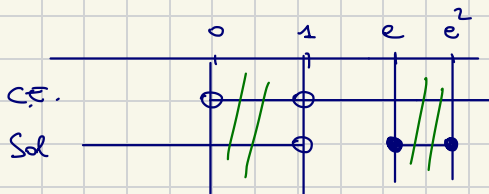
$\boxed{\begin{array}{c} 0 < x < 1 \\ \vee \\ e \le x \le e^2 \end{array}}$

534: $\left|\log_3|2x+3|\right| - 3 > 0$ C.E. $|2x+3| > 0$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad 2x+3 \neq 0$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad x \neq -\frac{3}{2}$

Caso 1: $2x+3 > 0$ $x > -\frac{3}{2}$

$\left|\log_3(2x+3)\right| - 3 > 0$

Caso a $\log_3(2x+3) > 0$ ⟿ $2x+3 > 1$ ⟿ $x > -1$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad x > 12$
$\qquad\quad \log_3(2x+3) > 3$ ⟿ $2x+3 > 27$ ⟿ $\boxed{x > 12}$

Caso b: $\log_3(2x+3) < 0$ ⟿ $x < -1$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad x < -15$
$\qquad\quad \log_3(2x+3) < \boxed{-3}$ ⟿ $2x+3 < \boxed{-27}$ ⟿ $\boxed{x < -15}$

Sol caso 1: (Unione a-b) e sistema con caso 1 $\boxed{x > 12}$

Caso 2: $x < -\frac{3}{2}$

$\left|\log_3(-2x-3)\right| - 3 > 0$

Caso a: $\log_3(-2x-3) > 0$ ⟿ $-2x-3 > 1$ ⟿ $x < -2$

$\quad \log_3(-2x-3) > 3$ $-2x-3 > 27$ ⟿ $\boxed{x < -15}$

Caso b $\log_3(-2x-3) < 0$ $x > -2$

$\quad \log_3(-2x-3) < -3$ $-2x-3 =$