

21/2/2018

315

$$\log_2(2x + 11) = \log_2(x + 10)$$

$$2x + 11 = x + 10$$

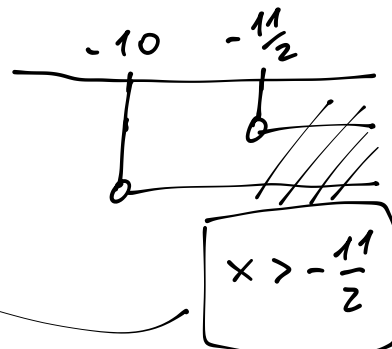
$$2x - x = 10 - 11$$

$$x = -1$$

ACCEPTABLE

C.E.

$$\begin{cases} 2x + 11 > 0 \\ x + 10 > 0 \end{cases} \Rightarrow \begin{cases} x > -\frac{11}{2} \\ x > -10 \end{cases}$$



320

$$\log(x - 1) - \log(x + 2) = \log 3$$

$$\log \frac{x-1}{x+2} = \log 3$$

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

$$x - 1 = 3(x + 2)$$

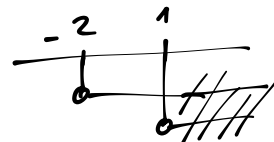
$$x - 1 = 3x + 6$$

$$2x = -7$$

$$x = -\frac{7}{2} \quad \text{NON ACCEPTABLE!}$$

C.E.

$$\begin{cases} x - 1 > 0 \\ x + 2 > 0 \end{cases} \Rightarrow \begin{cases} x > 1 \\ x > -2 \end{cases} \Rightarrow x > 1$$



325

$$\log(x - 1) - \log(x + 1) = \log(x - 3) - \log(x - 2)$$

$$\log \frac{x-1}{x+1} = \log \frac{x-3}{x-2}$$

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

$$(x-1)(x-2) = (x-3)(x+1)$$

$$x^2 - 2x - x + 2 = x^2 + x - 3x - 3$$

$$x = 5 \quad \text{OK}$$

C.E.

$$\begin{cases} x - 1 > 0 \\ x + 1 > 0 \\ x - 3 > 0 \\ x - 2 > 0 \end{cases}$$

$$\begin{cases} x > 1 \\ x > -1 \\ x > 3 \\ x > 2 \end{cases} \Rightarrow x > 3$$

C.E.

328

$$\log_5(x^2 + 1) = \log_5 2 + \log_5(x^2 - 4)$$

$$\log_5(x^2 + 1) = \log_5(2(x^2 - 4))$$

$$x^2 + 1 = 2(x^2 - 4)$$

$$x^2 + 1 = 2x^2 - 8$$

$$x^2 - 2x^2 = -8 - 1$$

$$-x^2 = -9$$

$$x^2 = 9 \quad \boxed{x = \pm 3}$$

OK

C.E.

$$\begin{cases} x^2 + 1 > 0 \\ x^2 - 4 > 0 \end{cases} \quad \begin{cases} \forall x \in \mathbb{R} \\ x < -2 \vee x > 2 \end{cases}$$

$\downarrow$   
 $x^2 - 4 = 0$   
 $\hookrightarrow x = \pm 2$

C.E.

$$\boxed{x < -2 \vee x > 2}$$

ex. 449

342

$$\log_2(x^2 + 2x + 8) = 2 + \log_2(x + 2)$$

$$\log_2(x^2 + 2x + 8) = \log_2 2^2 + \log_2(x + 2)$$

$$\log_a a^x = x$$

$$\log_2(x^2 + 2x + 8) = \log_2[4(x + 2)]$$

$$x^2 + 2x + 8 = 4x + 8$$

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

$$x(x - 2) = 0 \quad \begin{matrix} x = 0 \\ x = 2 \end{matrix}$$

OK

$$\boxed{x = 0 \vee x = 2}$$

C.E.

 $\Delta < 0$  $\forall x$ 

$$\begin{cases} x^2 + 2x + 8 > 0 \\ x + 2 > 0 \end{cases}$$

$$\boxed{x > -2}$$

345

$$\log_4^2 x + 3\log_4 x = 4$$

C.E.  
 $x > 0$

$$(\log_4 x)^2 + 3\log_4 x - 4 = 0$$

$$t = \log_4 x$$

$$t^2 + 3t - 4 = 0$$

$$(t+4)(t-1) = 0 \quad \begin{cases} t = -4 \\ t = 1 \end{cases}$$

$$\log_4 x = -4 \quad x = 4^{-4} = \frac{1}{4^4} = \frac{1}{256}$$

$$\log_4 x = 1 \quad x = 4$$

$$x = 4 \vee x = \frac{1}{256}$$