

# Equations logarithmiques (suite) (avec propriétés)

Exemples :

$$1) \log(2x-3) + \log(x+1) = \log(21) - \log(3)$$

$$\Leftrightarrow \log((2x-3)(x+1)) = \log(7)$$

$$\Leftrightarrow (2x-3)(x+1) = 7$$

$$\Leftrightarrow 2x^2 + 2x - 3x - 3 = 7$$

$$\Leftrightarrow 2x^2 - x - 10 = 0$$

$$\Delta = 1 + 80 = 81$$

$$\Leftrightarrow x_{1,2} = \frac{1 \pm 9}{4} = \begin{cases} 5/2 \\ -2 \end{cases}$$

⚠ vérif:  $\log(2 \cdot \frac{5}{2} - 3) + \log(\frac{5}{2} + 1) = \log(2) + \log(\frac{7}{2}) (= \log(2 \cdot \frac{7}{2}) = \log(7))$   
 $\log(2 \cdot (-2) - 3) + \dots$   
-7 impossible

$$\Rightarrow S = \left\{ \frac{5}{2} \right\}$$

$$2) \quad 2 \log_4(x) = \log_4(x-1) + 1$$

$$\Leftrightarrow \log_4(x^2) = \log_4(x-1) + \log_4(4)$$

$$\Leftrightarrow \log_4(x^2) = \log_4(4(x-1))$$

$$\Leftrightarrow x^2 = 4x - 4$$

$$\Leftrightarrow x^2 - 4x + 4 = 0 \quad \Delta = \dots = 0$$

$$\Leftrightarrow (x-2)^2 = 0$$

$$\Leftrightarrow x = 2 \quad \text{vérif : } 2 \log_4 \underbrace{(2)}_{>0} = \log_4 \underbrace{(1)}_{>0} + 1$$

$$\Rightarrow S = \{2\}$$

ex 4.2.6 b) c) d) f)