a) $\log_{10}(22 - x) = -1 + \log_{10}(x)$

$\log(22 - x) - \log(x) = -1$

$\log(A) + \log(B) = \log(A \cdot B)$

$\log(A) - \log(B) = \log\left(\frac{A}{B}\right)$

$\log_{10} 10^{-1}$

$8 = \log_{10} 10^{8}$

$24 = \log_{10} 10^{24}$

$-1 = \log_{10} 10^{-1} \rightarrow \log_{10} 10^{7} = 7 \cdot \log_{10} 10 = 7 \cdot 1 = 7$

$$\log 7^2 = 2 \cdot \log 7$$

$$\log_4 4 = 1$$

$$-1 = \log_{10} 10^{-1}$$

$$8 = \log_{10} 10^{8}$$

$$-31 = \log_{10} 10^{-31}$$

$$-1 = \log_7 7^{-1}$$

$$4 = \log_{11} 11^{4}$$

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$$\log_{10}\left(\frac{22-x}{x}\right) = \log_{10} 10^{-1}$$

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$$\frac{22-x}{x} = 10^{-1} \;\Rightarrow\; \frac{22-x}{x} = \frac{1}{10}$$

$$10 \cdot (22-x) = 1 \cdot x$$

$$220 - 10x = x$$

$$220 = 11x \;\Rightarrow\; x = \frac{220}{11} \;\Rightarrow\; x = 20$$

$$3 \log x = 2 \log x + \log 3$$

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$$3 \log x - 2 \log x = \log 3$$

$$\log x^3 - \log x^2 = \log 3$$

$$\log \frac{x^3}{x^2} = \log 3$$

$$x = 3$$

$$\log(x+3) + \log(x) = \log(4x)$$

$$\log_{10}[(x+3)\cdot x] = \log_{10}(4x)$$

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

$$x^2 - x = 0$$

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$$x \cdot (x-1) = 0$$

$x = 0$

$x - 1 = 0$

$x = 1$

$$\frac{\log 3 + \log(11 - x^3)}{\log(5 - x)} = 2$$

$$\log 3 + \log(11 - x^3) = 2 \cdot \log(5 - x)$$

$$\log 3 \cdot (11 - x^3) = \log (5 - x)^2$$

$$-3x^3 - x^2 + 10x + 8 = 0$$

$8 \to 0$

$\pm 8, \pm 4, \pm 2, \pm 1$

-1

$$-3x^2 + 2x + 8 = 0$$

$-4/3$

2

Sol $\begin{cases} x = -1 & \times \\ x = -4/3 & \times \\ x = 2 & \checkmark \end{cases}$

$\log 0 = \nexists$

$\log -a = \nexists$

$(x^2 - 5x + 9) \cdot \log 2 + \log 125 = 3 \longrightarrow 3 = \log_{10} 10^3$

$\Rightarrow \log 2^{(x^2-5x+9)} + \log 125 = \log 10^3$

$\Rightarrow \log 2^{(x^2-5x+9)} = \log 10^3 - \log 125$

$\rightarrow \log 2^{(x^2-5x+9)} = \log \frac{1000}{125}$

$2^{(x^2-5x+9)} = 8$

$8 = 2^3$

Ecuación exponencial

$$2^{(x^2-5x+9)} = 2^3$$

$$x^2-5x+9=3$$

$$x^2-5x+6=0$$

$x=2 \rightarrow$ ✓

$x=3 \rightarrow$ ✓

Comprobadas

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