1
321

$$\begin{cases} x+y=\frac{1}{6} \\ \frac{1}{x}+\frac{1}{y}=-\frac{1}{2} \end{cases}$$

$\frac{x+y}{xy}=-\frac{1}{2}\ ;\ 2(x+y)=-xy\ ;\ xy=-2(x+y)=-2\frac{1}{6}=-\frac{1}{3}$

$y=\frac{1}{6}-x$

$x\left(\frac{1}{6}-x\right)=-\frac{1}{3}\ ;\ -x^2+\frac{1}{6}x=-\frac{1}{3}$

$6x^2-x-2=0\ ;\ x=\frac{1\pm\sqrt{1+48}}{12}=\frac{1\pm7}{12}=$

x	y
$-\frac{1}{2}$	$\frac{2}{3}$
$\frac{2}{3}$	$-\frac{1}{2}$

Las dos soluciones son la misma, los números buscados son $\boxed{-\frac{1}{2}\ \text{y}\ \frac{2}{3}}$

2
381

$3^x+9^{x-1}=4$

$3^x+\frac{1}{9}(3^x)^2=4$

$(3^x)^2+9\times3^x-36=0$

$3^x=\frac{-9\pm\sqrt{81+144}}{2}=\frac{-9\pm15}{2}=3$

[La otra raíz, -12, no es válida, pues $3^x>0$]

$3^x=3\Rightarrow\boxed{x=1}$

3
382

$\log x=\log2+2\log(x-3)$

$\log x=\log\left[2(x-3)^2\right]$

$2(x-3)^2=x$

$2x^2-13x+18=0\ ;\ x=\begin{cases}2\ \text{NO}\ [\log(2-3)\ \text{no existe}]\ \ [2\ \text{p}] \\ \boxed{9/2=4,5}\ \ [8\ \text{p}]\end{cases}$

4
418

$$\begin{cases} \log(x+y)-\log(x-y)=\log5 \\ \frac{2^x}{2^y}=2 \end{cases}$$

$$\begin{cases} \log\frac{x+y}{x-y}=\log5 \\ 2^{x-y}=2 \end{cases}\Rightarrow\begin{cases} \frac{x+y}{x-y}=5 \\ x-y=1 \end{cases}$$

$$\begin{cases} 4x-6y=0 \\ x-y=1 \end{cases}\ \begin{cases} 2x-3y=0 \\ y=x-1 \end{cases}$$

$2x-3(x-1)=0\ ;\ \boxed{x=3\ ;\ y=2}$

	+ ☐	5 425	$\frac{2x-1}{x-3} = 3 - \frac{x-3}{x-1}$ $(2x-1)(x-1) = 3(x-3)(x-1) - (x-3)^2$ $2x^2 - 3x + 1 = 3x^2 - 12x + 9 - x^2 + 6x - 9$ $3x + 1 = 0$; $\boxed{x = -\frac{1}{3}}$
	+ ☐	6 447	
	+ ☐	7 518	$\begin{cases}\log(x+y) - \log(x-y) = \log 5 \\ \frac{2^x}{2^y} = 2\end{cases}$ $\begin{cases}\log\frac{x+y}{x-y} = \log 5 \\ 2^{x-y} = 2\end{cases} \Rightarrow \begin{cases}\frac{x+y}{x-y} = 5 \\ x - y = 1\end{cases}$ $\begin{cases}4x - 6y = 0 \\ x - y = 1\end{cases} \begin{cases}2x - 3y = 0 \\ y = x - 1\end{cases}$ $2x - 3(x-1) = 0$; $\boxed{x = 3;\ y = 2}$