

## Departamento de Matemáticas $1^{\underline{0}}$ Bachillerato



9 - Ecuaciones exponenciales y logarítmicas

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(a)  $10^{3-x} = 1$ 

**Sol:** [3]

(b)  $5^{x+3} = 125$ 

**Sol:** [0]

(c)  $5^{1-x^2} = \frac{1}{125}$ 

**Sol:** [-2, 2]

(d)  $5^{x^2-5x+6} = 1$ 

**Sol:** [2, 3]

(e)  $2^{1-x} = \frac{1}{8}$ 

**Sol:** [4]

(f)  $2^{x+3} = 4^{-x}$ 

**Sol:** [-1]

(g)  $9^{x-1} = 3^{x+1}$ 

**Sol:** [3]

(h)  $4^{4x+3} = 2^{-x}$ 

**Sol:**  $\left[ -\frac{2}{3} \right]$ 

(i)  $8^{x-1} = 4^{3x+1}$ 

**Sol:**  $\left[ -\frac{5}{3} \right]$ 

(j)  $5^{-x} = 0.04$ 

**Sol:** [2]

(k)  $10^x \cdot 10^{-2x+7} = 100$ 

**Sol:** [5]

(1)  $(3^x)^2 \cdot 3^x = 9^3$ 

**Sol:** [2]

(m)  $\sqrt{2 \cdot \sqrt{2 \cdot \sqrt{2}}} = 2^x$ 

Sol:  $\left[\frac{7}{8}\right]$ 

(n)  $2^{x^2-5x} = 64^{-1}$ 

**Sol:** [2, 3]

 $(\tilde{n})$   $\sqrt{\sqrt{3} + \sqrt{3} + \sqrt{3}} = 3^{x+2}$ 

**Sol:**  $\left[ -\frac{5}{4} \right]$ 

(o)  $\sqrt[x]{216} = 6$ 

**Sol:** [3]

(p)  $4^x - 2^x = 2$ 

**Sol:** [1]

(q)  $5^x - 30 \cdot 5^x + 145 = 0$ 

**Sol:** [1]

(r)  $2^{x-1} + 2^x + 2^{x+1} = 7$ 

**Sol:** [1]

 $2.\ p028e05$  - Resuelve las siguientes ecuaciones exponenciales:

(a) 
$$3^{x+1} + 3^x + 3^{x-1} = 117$$

**Sol:** [3]

(b) 
$$3^x + 3^{x-1} + 3^{x-2} + 3^{x-3} + 3^{x-4} = 363$$

**Sol:** [5]

(c) 
$$2^{3x} - \frac{3}{2^{3x+2}} + 1 = 0$$

**Sol:**  $\left[ -\frac{1}{3} \right]$ 

(d) 
$$3^{x-1} + 3^{2-x} = 4$$

**Sol:** [1, 2]

(e) 
$$2^{x+1} + 4^x = 80$$

**Sol:** [3]

(f) 
$$2^{2x} - 3 \cdot 2^{x+1} + 8 = 0$$

**Sol:** [1, 2]

(g) 
$$3^{2x-3} + 1 = 4 \cdot 3^{x-2}$$

**Sol:** [1, 2]

(h) 
$$2^{2x} - 10 \cdot 2^x + 16 = 0$$

**Sol:** [1, 3]

(i) 
$$16^x - 4^x = 240$$

**Sol:** [2]

(i) 
$$9^x - 6 \cdot 3^{x+1} + 81 = 0$$

**Sol:** [2]

(k) 
$$3^{x+2} + 9^{x+1} = 810$$

**Sol:** [2]

(l) 
$$5^{x-1} = 2 + \frac{3}{5^{x-2}}$$

**Sol:** [2]

(m) 
$$3^{x+1} + 3^{x-2} = \frac{15}{3^{x-1}} + \frac{247}{3^{x-2}}$$

**Sol:** [3]

(n) 
$$4^{2x} + 16 \cdot 4^{-2x} - 10 = 0$$

**Sol:**  $\begin{bmatrix} \frac{1}{4}, & \frac{3}{4} \end{bmatrix}$ 

3. p028e06 - Resuelve los siguientes sistemas:

(a) 
$$\begin{cases} 3^x = 3^y \\ 4^x \cdot 4^y = 256 \end{cases}$$

**Sol:**  $[\{x:2, y:2\}]$ 

(b) 
$$\begin{cases} 2^{x+2y} = 32\\ 2^{3x-5y} = 16 \end{cases}$$

**Sol:**  $[\{x:3, y:1\}]$ 

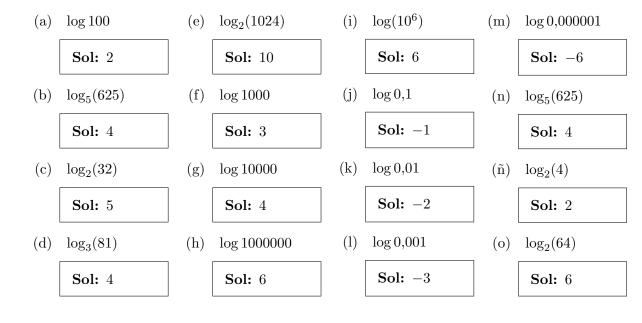
(c) 
$$\begin{cases} 5^x = 5^y \cdot 625 \\ 2^x \cdot 2^y = 256 \end{cases}$$

**Sol:**  $[\{x:6, y:2\}]$ 

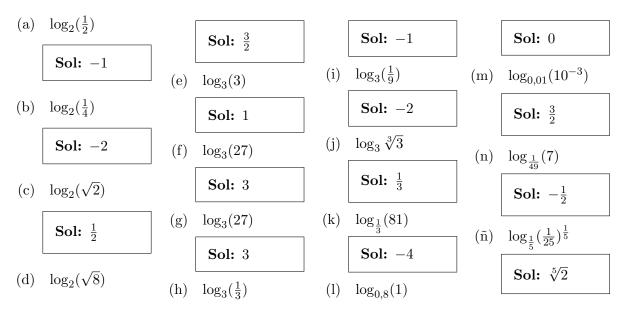
(d) 
$$\begin{cases} 2^x + 2^y = 24\\ 2^{x+y} = 128 \end{cases}$$

**Sol:**  $[\{x:3, y:4\}, \{x:4, y:3\}]$ 

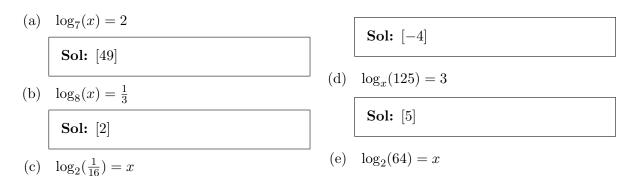
4. p028e07 - Calcula:



5. p028e07b - Calcula (continuación):



6. p028e08 - Averigua el valor de x en los siguientes casos:



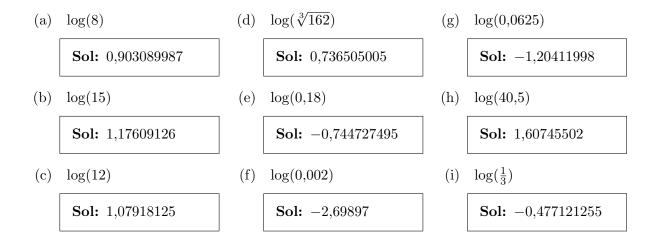
**Sol:** -1,90848502

(h)  $\log_x(5) + 2$ **Sol:** [6] Sol:  $\left\lceil \frac{\sqrt{5}}{5} \right\rceil$ (f)  $\log_x(9) = 2$  $\log_{0,008}(625) = 2x$ (i) **Sol:** [3] **Sol:**  $\left[ -\frac{2}{3} \right]$ (g)  $\log_2(x) = -3$ Sol:  $\left[\frac{1}{8}\right]$ 7. p<br/>028e09 - Sabiendo que log 2 = 0.301030, calcula (e)  $\log(\frac{1}{16})$ (i)  $\log(\sqrt[4]{\frac{1}{0.04}})$  $\log(16)$ (a) **Sol:** -1,20411998**Sol:** 1,20411998 **Sol:** 0,349485002 (b)  $\log(64)$ (f)  $\log(5)$ (j)  $\log \sqrt[3]{0.002}$ **Sol:** 1,80617997 **Sol:** 0,698970004 **Sol:** -0.899656668(c)  $\log(1024)$  $(g) \log(25)$ (k)  $\log(0.025)$ **Sol:** 3,01029996 **Sol:** 1,39794001 **Sol:** -1,60205999 $\log(\frac{1}{2})$ (d) (h)  $\log(0.0016)$ **Sol:** -2,79588002**Sol:** -0.752574989**Sol:** -0.3010299968. p028e10 - Sabiendo que log 3 = 0.477121, calcula (a)  $\log(243)$ (c)  $\log(0.003)$ (e)  $\log(\sqrt[5]{0.81})$ **Sol:** 2,38560627 **Sol:** -2,52287875**Sol:** -0.0183029962(d)  $\log(\sqrt[4]{0.03^3})$  $\log(0,0027)$ (f)  $\log(\frac{1}{81})$ (b)

9. p<br/>028e11 - Sabiendo que log 2=0.301030 y que log 3=0.477121 averigua, sin calculadora:

**Sol:** -2,56863624

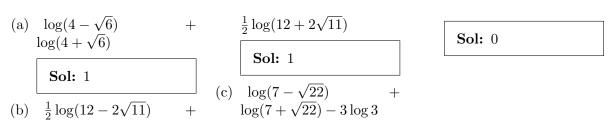
**Sol:** −1,14215906



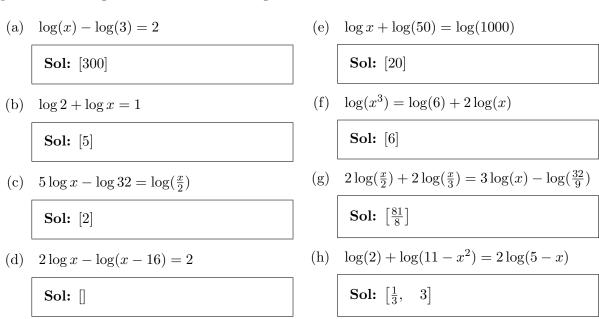
10. p<br/>028e12 - Sabiendo que log 2=0.301030 y que log 3=0.477121 averigua, sin calculadora:

(a) 
$$\log \frac{0,0027^3 \cdot \sqrt[4]{540}}{96 \cdot \sqrt[5]{51,84}}$$
 **Sol:**  $-9,3480145$ 

11. p029e15 - Realiza las siguientes operaciones:



12. p029e18 - Averigua el valor de x en los siguientes casos:



(i) 
$$\log(1250) - 2 = 2 - \log(2^{2-x})^{2+x}$$

**Sol:** [-1, 1]

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

(j) 
$$\log(x-1) - \log(\sqrt{5+x}) - \log(\sqrt{5-x}) =$$

Sol: 
$$\left[\frac{5}{4}\right]$$

 $13.\ p029e19$  - Resuelve los siguientes sistemas de inecuaciones:

(a) 
$$\begin{cases} \log x + \log y = 5 \\ \log x - \log y = 1 \end{cases}$$

**Sol:**  $[\{x:1000, y:100\}]$ 

**Sol:** 
$$[\{x: 10000, y: 10\}]$$

(c)  $\begin{cases} \log_2(x) + \log_2(x+y) = 4 \\ x+y = 2 \end{cases}$ 

(b) 
$$\begin{cases} 3\log x - 2\log y = 10\\ \log x + 3\log y = 7 \end{cases}$$

**Sol:** 
$$[\{x:8, y:-6\}]$$