1. p027e04 - Resuelve las siguientes ecuaciones exponenciales:

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

Sol: $[3]$

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

Sol: $[0]$

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

Sol: $[-2, \quad 2]$

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

Sol: $[2, \quad 3]$

(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: $[5]$

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

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: $[2, \quad 3]$

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

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]

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

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: $\left[\frac{1}{4}, \frac{3}{4}\right]$

3. p028e06 - Resuelve los siguientes sistemas:

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

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

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

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

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

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

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

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

4. p028e07 - Calcula:

(a) $\log 100$

Sol: 2

(b) $\log_5(625)$

Sol: 4

(c) $\log_2(32)$

Sol: 5

(d) $\log_3(81)$

Sol: 4

(e) $\log_2(1024)$

Sol: 10

(f) $\log 1000$

Sol: 3

(g) $\log 10000$

Sol: 4

(h) $\log 1000000$

Sol: 6

(i) $\log(10^6)$

Sol: 6

(j) $\log 0{,}1$

Sol: -1

(k) $\log 0{,}01$

Sol: -2

(l) $\log 0{,}001$

Sol: -3

(m) $\log 0{,}000001$

Sol: -6

(n) $\log_5(625)$

Sol: 4

(ñ) $\log_2(4)$

Sol: 2

(o) $\log_2(64)$

Sol: 6

5. p028e07b - Calcula (continuación):

(a) $\log_2(\frac{1}{2})$

Sol: -1

(b) $\log_2(\frac{1}{4})$

Sol: -2

(c) $\log_2(\sqrt{2})$

Sol: $\frac{1}{2}$

(d) $\log_2(\sqrt{8})$

Sol: $\frac{3}{2}$

(e) $\log_3(3)$

Sol: 1

(f) $\log_3(27)$

Sol: 3

(g) $\log_3(27)$

Sol: 3

(h) $\log_3(\frac{1}{3})$

Sol: -1

(i) $\log_3(\frac{1}{9})$

Sol: -2

(j) $\log_3 \sqrt[3]{3}$

Sol: $\frac{1}{3}$

(k) $\log_{\frac{1}{3}}(81)$

Sol: -4

(l) $\log_{0,8}(1)$

Sol: 0

(m) $\log_{0,01}(10^{-3})$

Sol: $\frac{3}{2}$

(n) $\log_{\frac{1}{49}}(7)$

Sol: $-\frac{1}{2}$

(ñ) $\log_{\frac{1}{5}}(\frac{1}{25})^{\frac{1}{5}}$

Sol: $\sqrt[5]{2}$

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

(a) $\log_7(x) = 2$

Sol: [49]

(b) $\log_8(x) = \frac{1}{3}$

Sol: [2]

(c) $\log_2(\frac{1}{16}) = x$

Sol: $[-4]$

(d) $\log_x(125) = 3$

Sol: [5]

(e) $\log_2(64) = x$

Sol: [6]

(f) $\log_x(9) = 2$

Sol: [3]

(g) $\log_2(x) = -3$

Sol: $\left[\frac{1}{8}\right]$

(h) $\log_x(5) + 2$

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

(i) $\log_{0,008}(625) = 2x$

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

7. p028e09 - Sabiendo que log 2 = 0,301030, calcula

(a) $\log(16)$

Sol: 1,20411998

(b) $\log(64)$

Sol: 1,80617997

(c) $\log(1024)$

Sol: 3,01029996

(d) $\log(\frac{1}{2})$

Sol: −0,301029996

(e) $\log(\frac{1}{16})$

Sol: −1,20411998

(f) $\log(5)$

Sol: 0,698970004

(g) $\log(25)$

Sol: 1,39794001

(h) $\log(0{,}0016)$

Sol: −2,79588002

(i) $\log(\sqrt[4]{\frac{1}{0,04}})$

Sol: 0,349485002

(j) $\log \sqrt[3]{0,002}$

Sol: −0,899656668

(k) $\log(0{,}025)$

Sol: −1,60205999

(l) $\log(\sqrt[4]{\frac{1}{1024}})$

Sol: −0,752574989

8. p028e10 - Sabiendo que log 3 = 0,477121, calcula

(a) $\log(243)$

Sol: 2,38560627

(b) $\log(0{,}0027)$

Sol: −2,56863624

(c) $\log(0{,}003)$

Sol: −2,52287875

(d) $\log(\sqrt[4]{0,03^3})$

Sol: −1,14215906

(e) $\log(\sqrt[5]{0,81})$

Sol: −0,0183029962

(f) $\log(\frac{1}{81})$

Sol: −1,90848502

9. p028e11 - Sabiendo que log 2 = 0,301030 y que log 3 = 0,477121 averigua, sin calculadora:

(a) $\log(8)$

Sol: 0,903089987

(b) $\log(15)$

Sol: 1,17609126

(c) $\log(12)$

Sol: 1,07918125

(d) $\log(\sqrt[3]{162})$

Sol: 0,736505005

(e) $\log(0{,}18)$

Sol: $-0{,}744727495$

(f) $\log(0{,}002)$

Sol: $-2{,}69897$

(g) $\log(0{,}0625)$

Sol: $-1{,}20411998$

(h) $\log(40{,}5)$

Sol: 1,60745502

(i) $\log(\frac{1}{3})$

Sol: $-0{,}477121255$

10. p028e12 - 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:

(a) $\log(4-\sqrt{6}) + \log(4+\sqrt{6})$

Sol: 1

(b) $\frac{1}{2}\log(12-2\sqrt{11}) + \frac{1}{2}\log(12+2\sqrt{11})$

Sol: 1

(c) $\log(7-\sqrt{22}) + \log(7+\sqrt{22}) - 3\log 3$

Sol: 0

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

(a) $\log(x) - \log(3) = 2$

Sol: [300]

(b) $\log 2 + \log x = 1$

Sol: [5]

(c) $5\log x - \log 32 = \log(\frac{x}{2})$

Sol: [2]

(d) $2\log x - \log(x-16) = 2$

Sol: []

(e) $\log x + \log(50) = \log(1000)$

Sol: [20]

(f) $\log(x^3) = \log(6) + 2\log(x)$

Sol: [6]

(g) $2\log(\frac{x}{2}) + 2\log(\frac{x}{3}) = 3\log(x) - \log(\frac{32}{9})$

Sol: $[\frac{81}{8}]$

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

Sol: $\left[\frac{1}{3}, \quad 3\right]$

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

Sol: $[-1, \quad 1]$

(j) $\log(x-1) - \log(\sqrt{5+x}) - \log(\sqrt{5-x}) = 0$

Sol: $[4]$

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

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

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

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

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

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