

TAREFA MÍNIMA

01.

a) $\log_2 16 = x$ b) $\log_4 16 = x$ c) $\log_3 81 = x$ d) $\log_5 125 = x$ e) $\log_{10} 100000 = x$ f) $\log_8 64 = x$ g) $\log_2 32 = x$

$$2^x = 16$$

$$4^x = 16$$

$$3^x = 81$$

$$5^x = 125$$

$$10^x = 10^5$$

$$8^x = 64$$

$$2^x = 32$$

$$2^x = 2^4$$

$$4^x = 4^2$$

$$3^x = 3^4$$

$$5^x = 5^3$$

$$x = 5$$

$$8^x = 8^2$$

$$2^x = 2^5$$

$$x = 4$$

$$x = 2$$

$$x = 4$$

$$x = 3$$

$$x = 2$$

$$x = 5$$

h) $\log_6 216 = x$

$$6^x = 216$$

$$6^x = 6^3$$

$$x = 3$$

02.

a) $\log_2 1/4 = x$ b) $\log_3 \sqrt{3} = x$ c) $\log_8 16 = x$ d) $\log_4 128 = x$ e) $\log_{36} \sqrt{6} = x$ f) $\log_{10} 0,01 = x$ g) $\log_9 \frac{1}{27} = x$

$$2^x = 1/4$$

$$3^x = 3^{1/2}$$

$$8^x = 16$$

$$4^x = 128$$

$$(6^2)^x = 6^{1/2}$$

$$10^x = 1/100$$

$$9^x = 1/27$$

$$2^x = 1/2^2$$

$$x = 1/2$$

$$2^{3x} = 2^4$$

$$2^{2x} = 2^7$$

$$6^{2x} = 6^{1/2}$$

$$10^x = 1/10^2$$

$$(3^2)^x = 1/3^3$$

$$2^x = 2^{-2}$$

$$3x = 4$$

$$2x = 7$$

$$2x = 1/2$$

$$10^x = 10^{-2}$$

$$3^{2x} = 3^{-3}$$

$$x = -2$$

$$x = 4/3$$

$$x = 7/2$$

$$x = 1/4$$

$$x = -2$$

$$x = -3/2$$

h) $\log_{0,2} \sqrt[3]{25} = x$ i) $\log_{1,25} 0,64 = x$

j) $\log_{\frac{3}{5}} 0,6 = x$

$$(0,2)^x = \sqrt[3]{25}$$

$$(1,25)^x = 0,64$$

$$(5/3)^x = 6/10$$

$$(2/10)^x = 25^{1/3}$$

$$(125/100)^x = 64/100$$

$$(5/3)^x = 3/5$$

$$(1/5)^x = 5^{2/3}$$

$$(5/4)^x = 8^2/10^2$$

$$x = -1$$

$$5^{-x} = 5^{2/3}$$

$$(5/4)^x = (4/5)^2$$

$$x = -2/3$$

$$x = -2$$

03.

$$A = \log_{25} 0,2 = x$$

$$B = \log_7 \frac{1}{49} = x$$

$$C = \log_{0,25} \sqrt{8} = x$$

$$D = \log_{10} 0,1 = x$$

$$A = 25^x = 0,2$$

$$B = 7^x = 1/49$$

$$C = 0,25^x = 8^{1/2}$$

$$10^x = 1/10$$

$$A = 25^x = 2/10$$

$$B = 7^x = 1/7^2$$

$$C = (25/100)^x = 8^{1/2}$$

$$10^x = 1/10^1$$

$$A = 5^{2x} = 1/5$$

$$B = 7^x = 7^{-2}$$

$$C = (1/4)^x = 8^{1/2}$$

$$10^x = 10^{-1}$$

$$A = 2x = -1$$

$$B = x = -2$$

$$C = (1/2^2)^x = (2^3)^{1/2}$$

$$x = -1$$

$$A = -1/2$$

$$B = x = -2$$

$$C = (2^{-2})^x = (2^3)^{1/2}$$

$$x = -1$$

$$C = -2x = 3/2$$

$$C = x = -3/4$$

Logo a ordem será: B, D, C, A

04.

a) $\log_{\frac{1}{8}} 4 = x$	b) $\log_{27} \sqrt{3} = x$	c) $\log_{16} 0,125 = x$	d) $\log_{\sqrt[5]{7}} 7 = x$	e) $\log_3 x = -2$	f) $\log_x \frac{1}{4} = -1$
$(1/8)^x = 4$	$27^x = 3^{1/2}$	$16^x = 125/1000$	$(\sqrt[5]{7})^x = 7^1$	$3^{-2} = x$	$x^{-1} = 1/4$
$(1/2)^{3x} = 2^2$	$3^{3x} = 3^{1/2}$	$16^x = 1/8$	$7^{x/5} = 7^1$	$1/9 = x$	$x = 4$
$-3x = 2$	$3x = 1/2$	$2^{4x} = 2^{-3}$	$x/5 = 1$		
$x = -2/3$	$x = 1/6$	$x = -3/4$	$x = 5$		

05.

a) $\log_5 5 + \log_3 1 - \log 10$	b) $\log_{\frac{1}{4}} 4 + \log_4 \frac{1}{4}$	c) $\log 1000 + \log 100 + \log 10 + \log 1$
$1 + \log_3 1 - 1$	$\log_{2^{-2}} 2^2 + \log_{2^2} 2^{-2}$	$\log_{10} 10^3 + \log_{10} 10^2 + \log_{10} 10 + \log_{10} 1$
$\log_3 1$	$-1 - 1$	$3 \cdot 1 + 2 \cdot 1 + 1 \cdot 1 + 0$
$3^x = 1$	-2	$3 + 2 + 1$
$x = 0$		6
d) $3^{\log_3 2} + 2^{\log_2 3}$	e) $\log_8(\log_3 9)$	
$2 + 3 = 5$	$\log_8 2$	
	$8^x = 2$	
	$2^{3x} = 2^1$	
	$x = 1/3$	

06.

a) $\log_b a = \frac{\log a}{\log b}$	b) $\log_a b = \frac{\log b}{\log a}$	c) $\log_a b^2$	d) $\log(ab)$	e) $\log(a/b)$
$\log_b a = \frac{2}{-1}$	$\log_a b = \frac{-1}{2}$	$2 \cdot \log_a b$	$\log a + \log b$	$\log a - \log b$
$\log_b a = -2$	$\log_a b = -1/2$	$2 \cdot \left(-\frac{1}{2}\right) = -1$	$2 - 1 = 1$	$2 - (-1) = 3$
f) $\log_{\sqrt{b}} a = \frac{\log a}{\log b^{1/2}}$				
$\log_b a = \frac{2}{\frac{1}{2} \cdot (-1)}$				
$\log_b a = -4$				

07.

a) $\log_5 x = \log_5 16$ b) $\log_3(4x - 1) = \log_3 x$ c) $\log x^2 = \log x$

$$x = 16$$

$$4x - 1 = x$$

$$x^2 = x$$

$$4x - x = 1$$

$$x^2 - x = 0$$

$$3x = 1$$

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

$$x = 1/3$$

$$x = 0 \text{ ou } x = 1$$

08.

a) $3^4 = x$	b) $x = (1/2)^{-2}$	c) $x^1 = 2$	d) $x^{-1} = 0,25$	e) $x^0 = 1$
$81 = x$	$x = 2^2$	$x = 2$	$x = 100/25$	$\{x \in R \mid x > 0\}$
	$x = 4$		$x = 4$	

09.

a) $1/25 = 5^x$	b) $5^x = 5^{1/7}$	c) $5^x = 5^{12}$	d) $5^x = 1/625^{1/9}$	e) $5^x = 2/10$
$1/5^2 = 5^x$	$x = 1/7$	$x = 12$	$5^x = 1/(5^4)^{1/9}$	$5^x = 1/5$
$5^{-2} = 5^x$			$5^x = 1/5^{4/9}$	$x = -1$
$x = -2$			$x = -4/9$	

10.

Calculando os valores de a e b:

$\log_{\sqrt{5}} a = 2010$	$\log_{5\sqrt{5}} b = 2020$
$a = (\sqrt{5})^{2010}$	$b = (5\sqrt{5})^{2020}$
$a = (5^{1/2})^{2010}$	$b = (5 \cdot 5^{1/2})^{2020}$
$a = 5^{1005}$	$b = (5^{3/2})^{2020}$
	$b = 5^{3030}$

Assim b/a será:

$$5^{3030} / 5^{1005} = 5^{2025}$$

11. Como $\Delta = 0$, temos:

$b^2 - 4.a.c = 0$	$x^2 + 4x + \log_2 m = 0$	$x = (-b \pm \sqrt{\Delta})/2a$
$4^2 - 4 \cdot 1 \cdot (\log_2 m) = 0$	$x^2 + 4x + 4 = 0$	$x = (-4 \pm \sqrt{0})/2 \cdot 1$
$16 - 4 \cdot (\log_2 m) = 0$		$x = -4/2$
$\log_2 m = 4$		$x = -2$
$m = 16$		

12.

a) $4^{3+\log_4 2}$

b) $5^{1-\log_5 4}$

c) $8^{\log_2 7}$

d) $81^{\log_3 2}$

e) $5^{\log_{25} 7}$

$$4^{3+\frac{1}{2}}$$

$$5^1 \cdot 5^{-\log_5 4}$$

$$(2^3)^{\log_2 7}$$

$$(3^4)^{\log_3 2}$$

$$5^{\log_5 7}$$

$$\frac{7}{4^2}$$

$$5^1 \cdot 5^{\log_5 4^{-1}}$$

$$2^{3 \log_2 7}$$

$$3^{4 \log_3 2}$$

$$\frac{1}{5^2} \cdot 5^{\log_5 7}$$

$$(2^2)^{7/2}$$

$$5^1 \cdot 4^{-1}$$

$$2^{\log_2 7^3}$$

$$3^{\log_3 2^4}$$

$$5^{\log_5 7^{1/2}}$$

$$2^7 = 128$$

$$5 \cdot 1/4 = 5/4$$

$$7^3 = 343$$

$$2^4 = 16$$

$$7^{1/2} = \sqrt{7}$$

13.

$$\log_{13} 13^{29} = 29$$

$$\log_7 7^{30} = 30$$

Logo o maior é $\log_7 7^{30}$.