

**3.1**1) Posons  $y = \log_2(8)$ .

$$2^y = 8$$

$$2^y = 2^3$$

$$y = 3$$

$$\log_2(8) = 3$$

2) Posons  $y = \log_3(1)$ .

$$3^y = 1$$

$$3^y = 3^0$$

$$y = 0$$

$$\log_3(1) = 0$$

3) Posons  $y = \log_2(1024)$ .

$$2^y = 1024$$

$$2^y = 2^{10}$$

$$y = 10$$

$$\log_2(1024) = 10$$

4) Posons  $y = \log_2(1)$ .

$$2^y = 1$$

$$2^y = 2^0$$

$$y = 0$$

$$\log_2(1) = 0$$

5) Posons  $y = \log_2(512)$ .

$$2^y = 512$$

$$2^y = 2^9$$

$$y = 9$$

$$\log_2(512) = 9$$

6) Posons  $y = \log_3\left(\sqrt[5]{3^2}\right)$ .

$$3^y = \sqrt[5]{3^2}$$

$$3^y = 3^{\frac{2}{5}}$$

$$y = \frac{2}{5}$$

$$\log_3\left(\sqrt[5]{3^2}\right) = \frac{2}{5}$$

7) Posons  $y = \log_3(3)$ .

$$3^y = 3$$

$$3^y = 3^1$$

$$y = 1$$

$$\log_3(3) = 1$$

8) Posons  $y = \log_2(\sqrt{2})$ .

$$2^y = \sqrt{2}$$

$$2^y = 2^{\frac{1}{2}}$$

$$y = \frac{1}{2}$$

$$\log_2(\sqrt{2}) = \frac{1}{2}$$

9) Posons  $y = \log_4(\sqrt[5]{64})$ .

$$4^y = \sqrt[5]{64}$$

$$4^y = \sqrt[5]{4^3}$$

$$4^y = 4^{\frac{3}{5}}$$

$$y = \frac{3}{5}$$

$$\log_4(\sqrt[5]{64}) = \frac{3}{5}$$

10) Posons  $y = \log_3\left(\frac{1}{243}\right)$ .

$$3^y = \frac{1}{243}$$

$$3^y = \frac{1}{3^5}$$

$$3^y = 3^{-5}$$

$$y = -5$$

$$\log_3\left(\frac{1}{243}\right) = -5$$

11) Posons  $y = \log_3(\sqrt[4]{27})$ .

$$3^y = \sqrt[4]{27}$$

$$3^y = \sqrt[4]{3^3}$$

$$3^y = 3^{\frac{3}{4}}$$

$$y = \frac{3}{4}$$

$$\log_3(\sqrt[4]{27}) = \frac{3}{4}$$

12) Posons  $y = \log_4\left(\frac{1}{\sqrt[3]{16}}\right)$ .

$$4^y = \frac{1}{\sqrt[3]{16}}$$

$$4^y = \frac{1}{\sqrt[3]{4^2}}$$

$$4^y = \frac{1}{4^{\frac{2}{3}}}$$

$$4^y = 4^{-\frac{2}{3}}$$

$$y = -\frac{2}{3}$$

$$\log_4\left(\frac{1}{\sqrt[3]{16}}\right) = -\frac{2}{3}$$

13) Posons  $y = \log_3(27)$ .

$$3^y = 27$$

$$3^y = 3^3$$

$$y = 3$$

$$\log_3(27) = 3$$

14) Posons  $y = \log_3\left(\frac{1}{81}\right)$ .

$$3^y = \frac{1}{81}$$

$$3^y = \frac{1}{3^4}$$

$$3^y = 3^{-4}$$

$$y = -4$$

$$\log_3\left(\frac{1}{81}\right) = -4$$

15) Posons  $y = \log_5(0,04)$ .

$$5^y = 0,04$$

$$5^y = \frac{4}{100}$$

$$5^y = \frac{1}{25}$$

$$5^y = \frac{1}{5^2}$$

$$5^y = 5^{-2}$$

$$y = -2$$

$$\log_5(0,04) = -2$$

16) Posons  $y = \log_{\frac{1}{8}}(64)$ .

$$\left(\frac{1}{8}\right)^y = 64$$

$$(8^{-1})^y = 8^2$$

$$8^{-y} = 8^2$$

$$-y = 2$$

$$y = -2$$

$$\log_{\frac{1}{8}}(64) = -2$$

17) Posons  $y = \log_{27}(3)$ .

$$27^y = 3$$

$$(3^3)^y = 3^1$$

$$3^{3y} = 3^1$$

$$3y = 1$$

$$y = \frac{1}{3}$$

$$\log_{27}(3) = \frac{1}{3}$$

18) Posons  $y = \log(100)$ .

$$10^y = 100$$

$$10^y = 10^2$$

$$y = 2$$

$$\log(100) = 2$$

19) Posons  $y = \log_4(\sqrt{2})$ .

$$4^y = \sqrt{2}$$

$$(2^2)^y = 2^{\frac{1}{2}}$$

$$2^{2y} = 2^{\frac{1}{2}}$$

$$2y = \frac{1}{2}$$

$$y = \frac{1}{4}$$

$$\log_4(\sqrt{2}) = \frac{1}{4}$$

20) Posons  $y = \log_{49}(\sqrt[3]{7})$ .

$$49^y = \sqrt[3]{7}$$

$$(7^2)^y = \sqrt[3]{7^1}$$

$$7^{2y} = 7^{\frac{1}{3}}$$

$$2y = \frac{1}{3}$$

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

$$\log_{49}(\sqrt[3]{7}) = \frac{1}{6}$$

21) Posons  $y = \log_9(\sqrt[4]{81})$ .

$$9^y = \sqrt[4]{81}$$

$$9^y = \sqrt[4]{9^2}$$

$$9^y = 9^{\frac{2}{4}}$$

$$y = \frac{2}{4} = \frac{1}{2}$$

$$\log_9(\sqrt[4]{81}) = \frac{1}{2}$$

22) Posons  $y = \log_{0,25}(\sqrt{8})$ .

$$0,25^y = \sqrt{8}$$

$$\left(\frac{1}{4}\right)^y = \sqrt{2^3}$$

$$(2^{-2})^y = 2^{\frac{3}{2}}$$

$$2^{-2y} = 2^{\frac{3}{2}}$$

$$-2y = \frac{3}{2}$$

$$y = -\frac{3}{4}$$

$$\log_{0,25}(\sqrt{8}) = -\frac{3}{4}$$

23) Posons  $y = \ln(e) = \log_e(e)$ .

$$e^y = e$$

$$e^y = e^1$$

$$y = 1$$

$$\ln(e) = 1$$

24) Posons  $y = \log_{0,1}(0,000\ 01)$ .

$$0,1^y = 0,000\ 01$$

$$\left(\frac{1}{10}\right)^y = \frac{1}{100000}$$

$$(10^{-1})^y = \frac{1}{10^5}$$

$$10^{-y} = 10^{-5}$$

$$-y = -5$$

$$y = 5$$

$$\log_{0,1}(0,000\ 01) = 5$$

25) Posons  $y = \log_a(1)$ .

$$a^y = 1$$

$$a^y = a^0$$

$$y = 0$$

$$\log_a(1) = 0$$

26) Posons  $y = \log_a(a)$ .

$$a^y = a$$

$$a^y = a^1$$

$$y = 1$$

$$\log_a(a) = 1$$

27) Posons  $y = \log_a(a^3)$ .

$$a^y = a^3$$

$$y = 3$$

$$\log_a(a^3) = 3$$

28) Posons  $y = \log_a\left(\frac{1}{a}\right)$ .

$$a^y = \frac{1}{a}$$

$$a^y = a^{-1}$$

$$y = -1$$

$$\log_a\left(\frac{1}{a}\right) = -1.$$

29) Posons  $y = \log_a(\sqrt{a})$ .

$$a^y = \sqrt{a}$$

$$a^y = a^{\frac{1}{2}}$$

$$y = \frac{1}{2}$$

$$\log_a(\sqrt{a}) = \frac{1}{2}$$

30) Posons  $y = \log_a(\sqrt[3]{a^5})$ .

$$a^y = \sqrt[3]{a^5}$$

$$a^y = a^{\frac{5}{3}}$$

$$y = \frac{5}{3}$$

$$\log_a(\sqrt[3]{a^5}) = \frac{5}{3}$$

31) Posons  $y = \log_a\left(\frac{1}{\sqrt{a}}\right)$ .

$$a^y = \frac{1}{\sqrt{a}}$$

$$a^y = \frac{1}{a^{\frac{1}{2}}}$$

$$a^y = a^{-\frac{1}{2}}$$

$$y = -\frac{1}{2}$$

$$\log_a\left(\frac{1}{\sqrt{a}}\right) = -\frac{1}{2}$$

$$32) \text{ Posons } y = \log_a(a^{-2} \cdot \sqrt[3]{a}) .$$

$$a^y = a^{-2} \cdot \sqrt[3]{a}$$

$$a^y = a^{-2} \cdot a^{\frac{1}{3}}$$

$$a^y = a^{-2+\frac{1}{3}} = a^{-\frac{5}{3}}$$

$$y = -\frac{5}{3}$$

$$\log_a(a^{-2} \cdot \sqrt[3]{a}) = -\frac{5}{3}$$