

Lista 8 de CM300

1. Calcule o valor da função nos pontos x_1 e x_2 indicados.

(a) $f(x) = 2^x$, $x_1 = 3$, $x_2 = -4$.

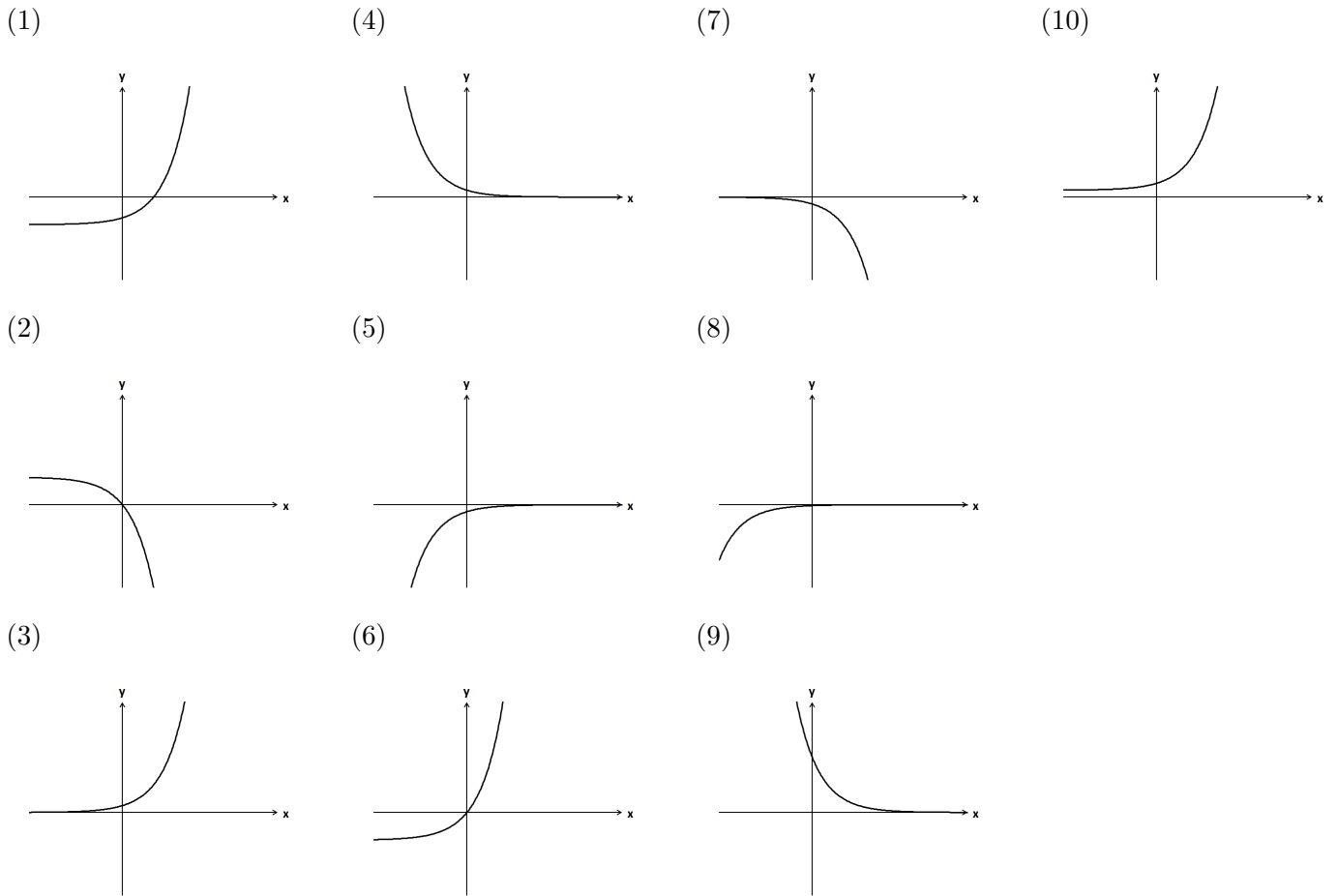
(b) $g(x) = 3\left(\frac{1}{2}\right)^x$, $x_1 = 2$, $x_2 = 0$.

(c) $h(x) = 5 \cdot 4^x$, $x_1 = -\frac{1}{2}$, $x_2 = 3$.

(d) $u(x) = -9 \cdot 3^x$, $x_1 = \frac{1}{3}$, $x_2 = -2$.

2. Associe a cada gráfico a função exponencial que o define. Obs: todos os eixos x estão na mesma escala, bem como os eixos y , porém a escala dos eixos x é diferente da dos eixos y .

(a) $a(x) = 2^x$ (b) $b(x) = \left(\frac{1}{2}\right)^x$ (c) $c(x) = -2^x$ (d) $d(x) = -\left(\frac{1}{2}\right)^x$ (e) $e(x) = 2^x + 1$
 (f) $f(x) = 2^x - 4$ (g) $g(x) = 2^{x+2} - 4$ (h) $h(x) = \left(\frac{1}{2}\right)^{x-3}$ (i) $i(x) = -\left(\frac{1}{2}\right)^{x+3}$ (j) $j(x) = -2^{x+2} + 4$

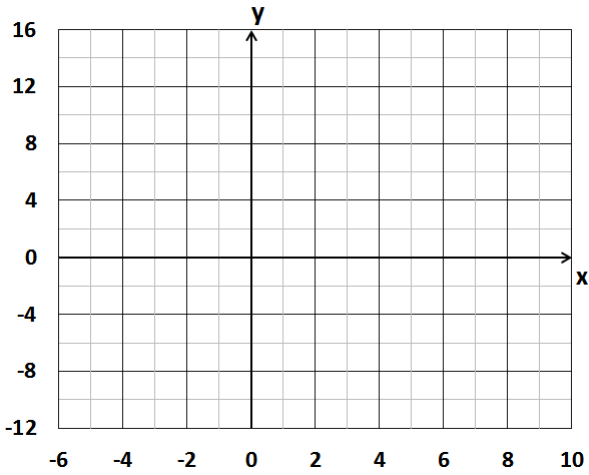


3. Sem o uso de calculadora, encontre o valor dos logaritmos abaixo.

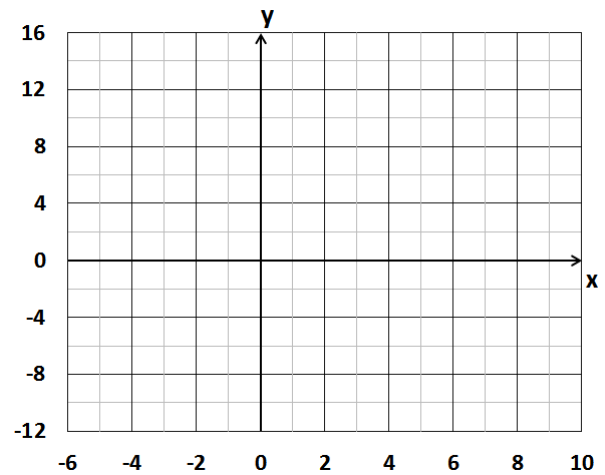
(a) $\log_2 8$ (b) $\log_2 \frac{1}{4}$ (c) $\log_{\frac{1}{3}} 9$ (d) $\log_{\frac{1}{4}} 2$
 (e) $\log_{16} 2$ (f) $\log_8 32$ (g) $\log_8 \frac{1}{4}$ (h) $\log_9 \frac{1}{27}$
 (i) $\log_5 \frac{1}{125}$ (j) $\log_{125} \frac{1}{5}$ (k) $\log_{16} 64$ (l) $\log_{\frac{1}{9}} \frac{1}{3}$

4. Esboce os gráficos das funções abaixo. Obs: note que os eixos x e y não estão na mesma escala. Isso ajuda a representar melhor os gráficos das exponenciais.

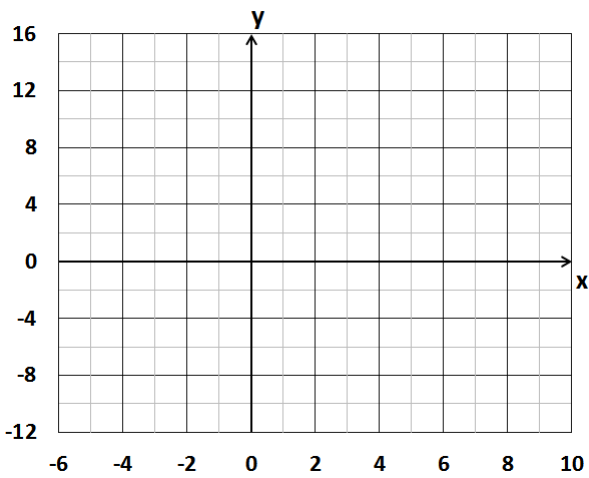
(a) $f(x) = 2^x - 4$



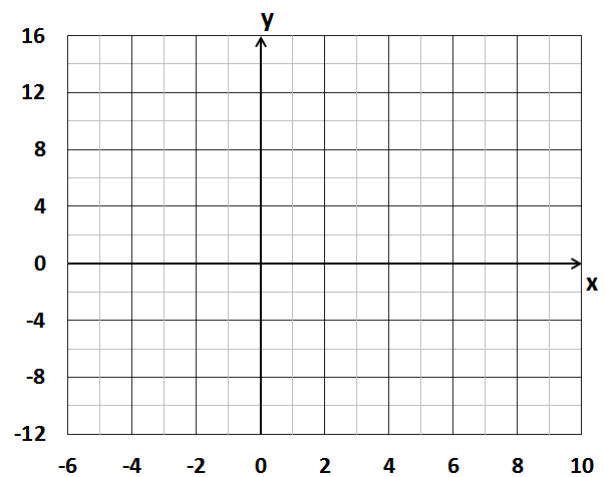
(d) $f(x) = -2^{x-4}$



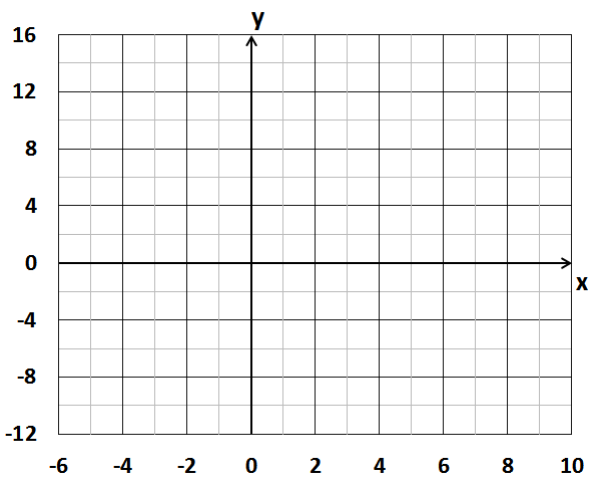
(b) $f(x) = -3 \cdot 2^x + 8$



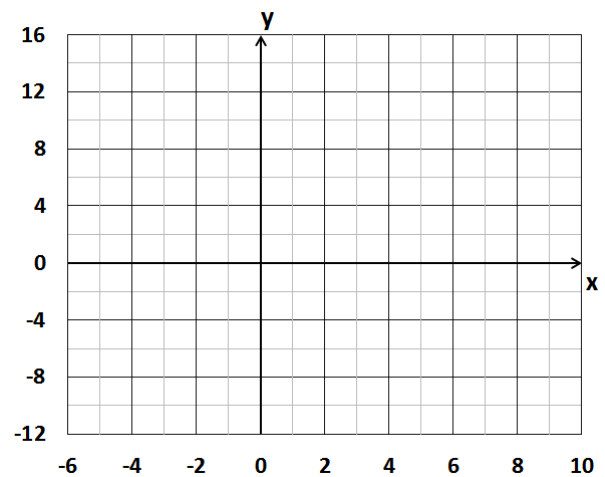
(e) $f(x) = 4^{x-4} - 8$



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



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



5. Utilizando uma calculadora, encontre o valor aproximado dos logaritmos abaixo com 3 casas decimais.

- | | | | |
|-----------------|---------------------------------------|----------------------------|-----------------------|
| (a) $\log_3 5$ | (b) $\log_3 \frac{1}{5}$ | (c) $\log_{\frac{1}{3}} 5$ | (d) $\log_5 3$ |
| (e) $\log_2 10$ | (f) $\log_{\frac{1}{2}} \frac{1}{10}$ | (g) $\ln 5$ | (h) $\ln \frac{1}{2}$ |

6. Encontre as soluções das equações abaixo.

(a) $2^x = 16$

(b) $2^{2x+1} = 16$

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

(d) $2 \cdot 3^{x+5} = 5$

(e) $5^{2x+1} = 2^x$

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

(g) $7^{-2x+3} = 10$

(h) $2 \cdot 3^x = 3 \cdot 2^x$

(i) $2 \cdot 3^x = 3 \cdot 2^{x+1}$

(j) $2^{x^2} = 2^x$

(k) $2^{x^2} = 3$

(l) $5^{3+x} = \frac{1}{125}$

Respostas:

1. (a) $f(3) = 8, f(-4) = \frac{1}{16}$.

(b) $g(2) = \frac{3}{4}, g(0) = 3$.

(c) $h\left(-\frac{1}{2}\right) = \frac{5}{2}, h(3) = 320$.

(d) $u\left(\frac{1}{3}\right) = 9\sqrt[3]{3}, u(-2) = -1$.

2. 1-f 2-j 3-a 4-b 5-d 6-g 7-c 8-i 9-h 10-e.

3. (a) 3

(c) -2

(e) $\frac{1}{4}$

(g) $-\frac{2}{3}$

(i) -3

(k) $\frac{3}{2}$

(b) -2

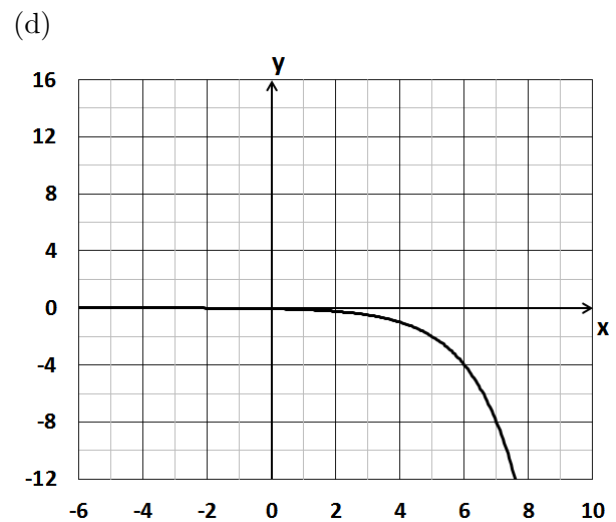
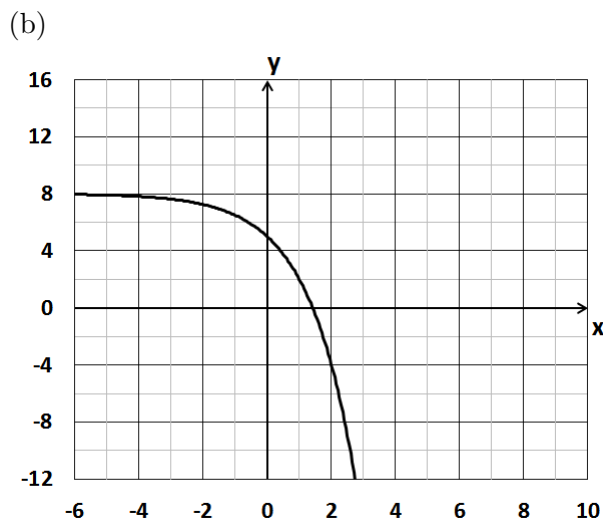
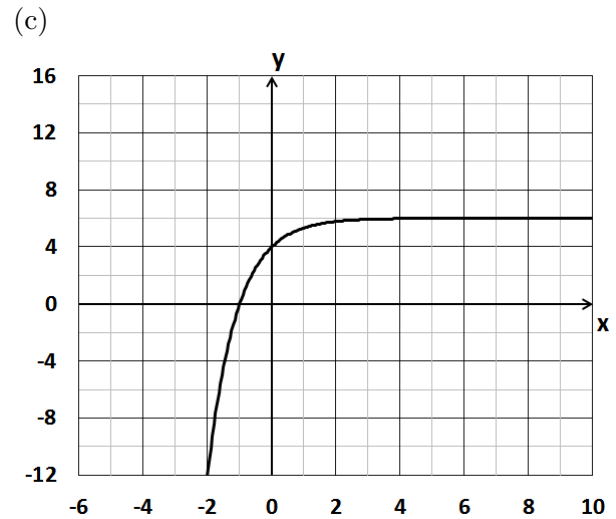
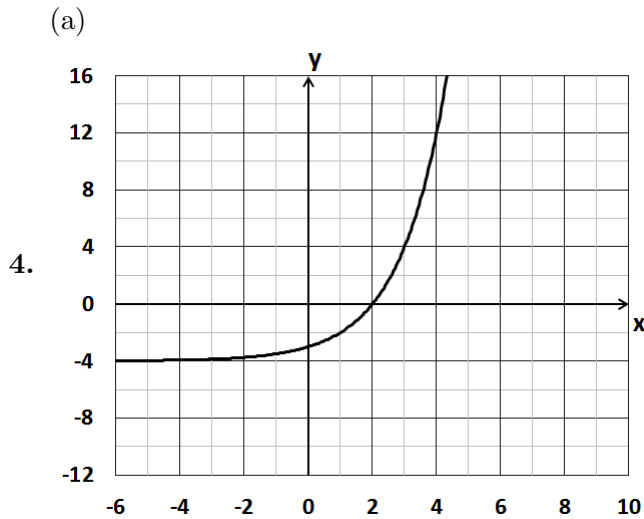
(d) $-\frac{1}{2}$

(f) $\frac{5}{3}$

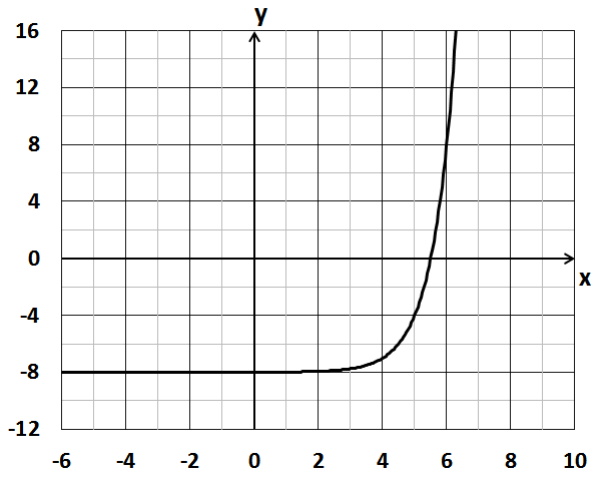
(h) $-\frac{3}{2}$

(j) $-\frac{1}{3}$

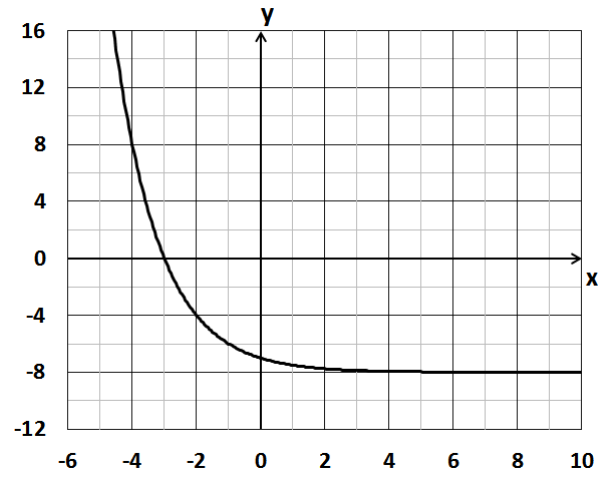
(l) $\frac{1}{2}$



(e)



(f)



5. (a) 1,465
(b) -1,465

- (c) -1,465
(d) 0,683

- (e) 3,322
(f) 3,322

- (g) 1,609
(h) -0,693

6. (a) $x = 4$

(b) $x = \frac{3}{2}$

(c) $x = \frac{\log_3 4 + 2}{3}$

(d) $x = \log_3 \left(\frac{5}{2} \right) - 5$

(e) $x = \frac{1}{\log_5 2 - 2}$

(f) $x = \frac{4}{3}$

(g) $x = \frac{3 - \log_7 10}{2}$

(h) $x = 1$

(i) $x = \frac{1}{1 - \log_3 2}$

(j) $x = 0$ ou $x = 1$

(k) $x = \pm \sqrt{\log_2 3}$

(l) $x = -6$