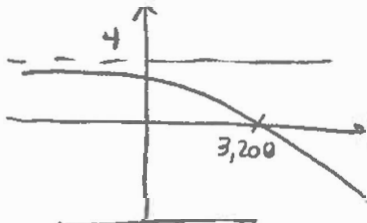
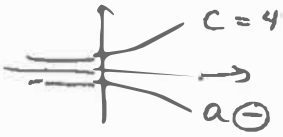


$$1. \quad y = -3 \left(\frac{1}{2}\right)^{-2x+6} + 4$$

$$a) \quad y = -3 \left(\frac{1}{2}\right)^{-2(x-3)} + 4$$

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



b) décroissante.

$$c) \quad 0 = -3(4)^{x-3} + 4$$

$$1,3 = 4^{x-3}$$

$$x-3 = \log_4 1,3$$

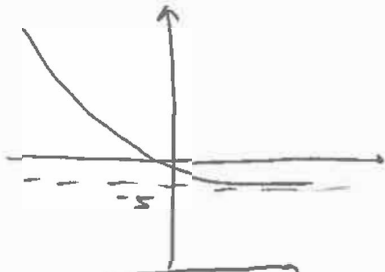
$$x-3 = 0,208 \Rightarrow \boxed{x = 3,208}$$

$$d) \quad \boxed{-\infty, 3,208[}$$

$$a) \quad y = 4(2)^{-x+6} - 5$$

$$y = 4(2)^{-1(x-6)} - 5$$

$$y = 4\left(\frac{1}{2}\right)^{x-6} - 5$$



b) décroissante

$$c) \quad 0 = 4\left(\frac{1}{2}\right)^{x-6} - 5$$

$$1,25 = \frac{1}{2}^{x-6}$$

$$x-6 = \log_{\frac{1}{2}} 1,25$$

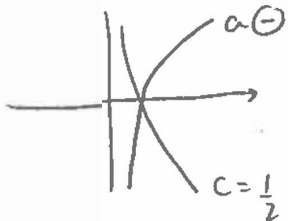
$$x-6 = -0,32$$

$$\boxed{x = 5,678}$$

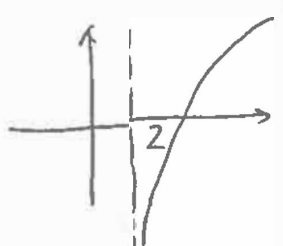
$$d) \quad \boxed{-\infty, 5,678[}$$

$$2. \quad y = -3 \log_{\frac{1}{2}}(3x-6) - 12$$

$$y = -3 \log_{\frac{1}{2}}[3(x-2)] - 12$$



⇒



b) Croissante

$$c) \quad 0 = -3 \log_{\frac{1}{2}}(3x-6) - 12$$

$$-4 = \log_{\frac{1}{2}}(3x-6)$$

$$\left(\frac{1}{2}\right)^{-4} = 3x-6$$

$$16 = 3x-6$$

$$\boxed{x = 7,3}$$

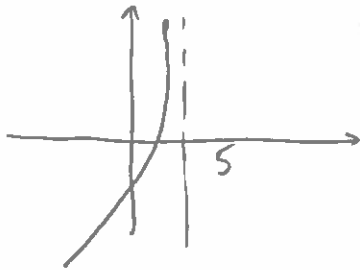
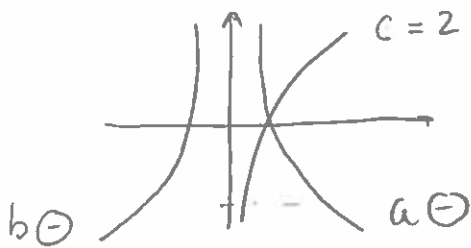
$$d) \quad \boxed{]2, 7,3[}$$

$$3x-6 > 0$$

$$\boxed{x > 2}$$

$$2. y = -2 \log_2 (5-x) + 4$$

$$y = -2 \log_2 [-(x-5)] + 4$$



b) Croissante

$$c) 0 = -2 \log_2 (5-x) + 4$$

$$2 = \log_2 (5-x)$$

$$2^2 = 5-x$$

$$4 = 5-x$$

$$\boxed{1 = x}$$

$$5-x > 0$$

$$-x > -5$$

$$\boxed{x < 5}$$

$$d) \boxed{-\infty, 1[}$$

$$3. a) V_f = 1000 (1,01)^{20} = \boxed{1220,19 \$}$$

↳ 4% → 12 mois  
x → 3 mois

$$b) V_f = 30000 (1,006)^9 = \boxed{31848,75 \$}$$

↳ 2% → 12 mois  
x → 4 mois

$$c) 1300 = 1000 (1,01)^x$$

$$1,3 = 1,01^x$$

$$x = \log_{1,01} 1,3 = 26,37 \text{ "3 mois"}$$

$$\text{↳ } \div 4 = \boxed{6,59 \text{ ans}}$$

$$d) 31000 = 30000 (1,006)^x$$

$$1,033 = 1,006^x$$

$$x = \log_{1,006} 1,033 = 4,93 \text{ "4 mois"}$$

$$\text{↳ } \div 3 = \boxed{1,64 \text{ ans}}$$

$$4. a) \frac{8^{2x-3}}{2^{x-1}} \cdot 16^{3x} = 4^{5x+2}$$

$$\frac{(2^3)^{2x-3}}{2^{x-1}} \cdot (2^4)^{3x} = (2^2)^{5x+2}$$

$$\frac{2^{6x-9}}{2^{x-1}} \cdot 2^{12x} = 2^{10x+4}$$

$$2^{5x-8} \cdot 2^{12x} = 2^{10x+4}$$

$$2^{17x-8} = 2^{10x+4}$$

$$17x-8 = 10x+4$$

$$7x = 12$$

$$x = \frac{12}{7} = 1,71\dots$$

$$b) \left(\frac{1}{27}\right)^{-x+1} = 81^{2x} \cdot 9^{-x}$$

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

$$3^{3x-3} = 3^{8x} \cdot 3^{-2x}$$

$$3^{3x-3} = 3^{6x}$$

$$3x-3 = 6x$$

$$-3 = 3x$$

$$x = -1$$

$$5. a) 13^{4x-2} = 12^{2x+1}$$

$$13^{4x-2} = (13^{\log_{13} 12})^{2x+1}$$

$$13^{4x-2} = (13^{0,97})^{2x+1}$$

$$13^{4x-2} = 13^{1,94x+0,97}$$

$$4x-2 = 1,94x+0,97$$

$$2,06x = 2,97$$

$$x = 1,44$$

$$b) 5^x \cdot 7^{x-4} = 8^{3x+4}$$

$$5^x \cdot (5^{\log_5 7})^{x-4} = (5^{\log_5 8})^{3x+4}$$

$$5^x \cdot (5^{1,21})^{x-4} = (5^{1,29})^{3x+4}$$

$$5^x \cdot 5^{1,21x-4,84} = 5^{3,87x+5,16}$$

$$5^{2,21x-4,84} = 5^{3,87x+5,16}$$

$$2,21x-4,84 = 3,87x+5,16$$

$$-10 = 1,66x$$

$$x = 6,02$$

$$6.a) 6 \log_{\frac{1}{5}}(2x-7) - 1 = -7$$

$$\log_{\frac{1}{5}}(2x-7) = -1$$

$$2x-7 > 0 \quad \left(\frac{1}{5}\right)^{-1} = 2x-7$$

$$\boxed{x > 3,5}$$

$$5 = 2x - 7$$

$$12 = 2x$$

$$\boxed{x = 6}$$

$$b) \log_{\frac{1}{3}} 4 + \log_{\frac{1}{3}}(x+1,75) = \log_{\frac{1}{3}} x - 4$$

$$\log_{\frac{1}{3}} 4(x+1,75) = \log_{\frac{1}{3}} x - 4$$

$$\log_{\frac{1}{3}}(4x+7) - \log_{\frac{1}{3}} x = -4$$

$$\log_{\frac{1}{3}}\left(\frac{4x+7}{x}\right) = -4$$

$$\left(\frac{1}{3}\right)^{-4} = \frac{4x+7}{x}$$

$$81 = \frac{4x+7}{x}$$

$$81x = 4x + 7$$

$$77x = 7$$

$$\boxed{x = \frac{7}{77} = 0,09}$$

$$\boxed{x > 0}$$

$$\boxed{x > -1,7}$$

$$7.a) 0 = -7 \ln(5x+3) - 8$$

$$-\frac{8}{7} = \ln(5x+3)$$

$$5x+3 > 0$$

$$\boxed{x > -\frac{3}{5}}$$

$$e^{-1,14} = 5x+3$$

$$0,32 = 5x+3$$

$$\boxed{x = -0,54}$$

$$b) 0 = 7e^{x-4} - 14$$

$$\frac{14}{7} = \frac{7e^{x-4}}{7}$$

$$2 = e^{x-4}$$

$$x-4 = \log_e 2 = \ln 2$$

$$\boxed{x = 4,69}$$

$$8.a) \log_2 3 + 5 \log_2 x = \log_2 3 + \log_2 x^5 = \boxed{\log_2 3x^5}$$

$$b) 3 \log(2x) - 4 \log x + 5 \log x^2$$

$$\log 8x^3 - \log x^4 + \log x^{10} = \log \frac{8x^3}{x^4} \cdot x^{10} = \log \frac{8x^7}{x^4} = \boxed{\log 8x^3}$$

$$9. -5|x-7| + 17 = 0$$

$$\boxed{x = 10,4}$$

$$|x-7| = 3,4$$

$$\begin{matrix} x-7 & \oplus & x-7 \\ x-7 & \ominus & x-7 \end{matrix}$$

$$\boxed{x = 3,6}$$

$$x-7 = 3,4 \quad x-7 = -3,4$$