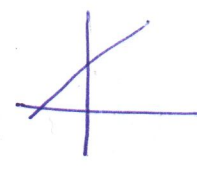


24

a) $f(x) = x+3 \rightarrow 1) y = x+3 \rightarrow x = y+3$

2) $y = x-3 \rightarrow f^{-1}(x) = x-3$

comp: $(f \circ f^{-1})(x) = f(f^{-1}(x)) = f(x-3) = x-3+3 = x \checkmark$

Obs: Pasa x y para cada y existe una única x \rightarrow 

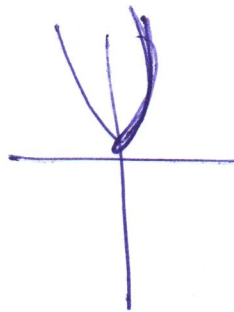
b) $f(x) = x^2+4 \rightarrow 1) y = x^2+4 \rightarrow x = y^2+4$

2) $y = \sqrt{x-4} \rightarrow f^{-1}(x) = \sqrt{x-4}$

comp: $(f \circ f^{-1})(x) = f(f^{-1}(x)) = f(\sqrt{x-4}) = (\sqrt{x-4})^2+4 = x-4+4 = x \checkmark$

Obs: Pasa sacar la recíproca por ramas:

No es inyectiva



c) $f(x) = \frac{1}{x} \rightarrow 1) y = \frac{1}{x} \rightarrow x = \frac{1}{y}$

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

comp: $(f \circ f^{-1})(x) = f(f^{-1}(x)) = f\left(\frac{1}{x}\right) = \frac{1}{\frac{1}{x}} = x \checkmark$

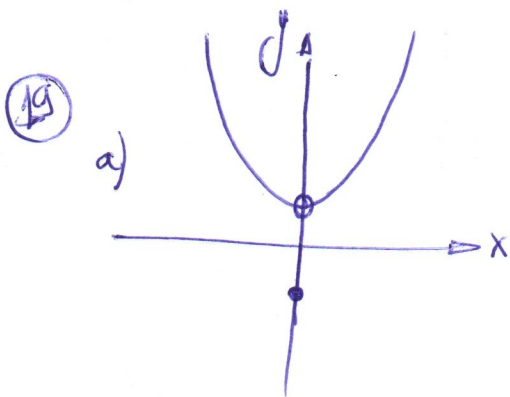
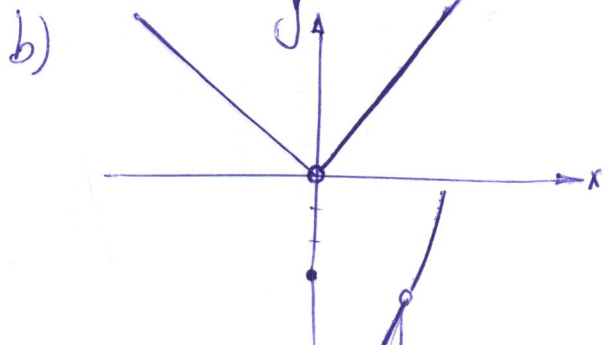
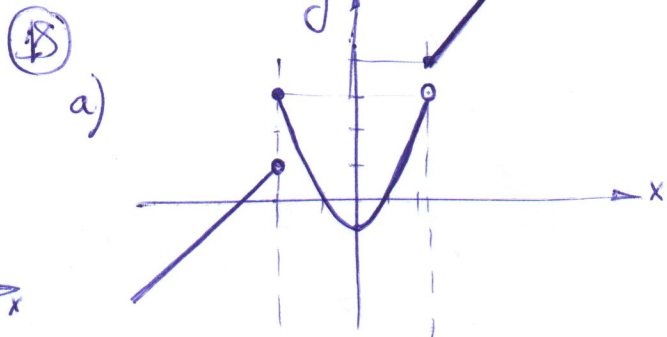
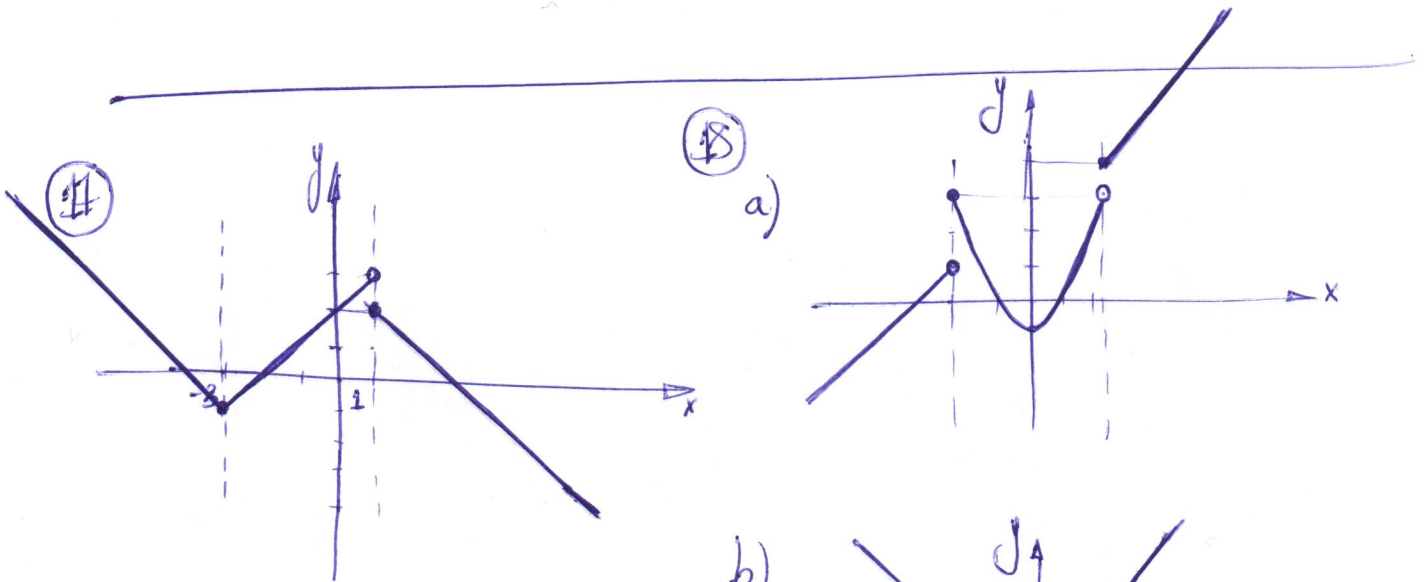
$$d) f(x) = \frac{x+2}{3} \rightarrow f^{-1}(y) = \frac{y+2}{3} \rightarrow x = \frac{y+2}{3}$$

$$e) 3x = y+2 \rightarrow y = 3x-2$$

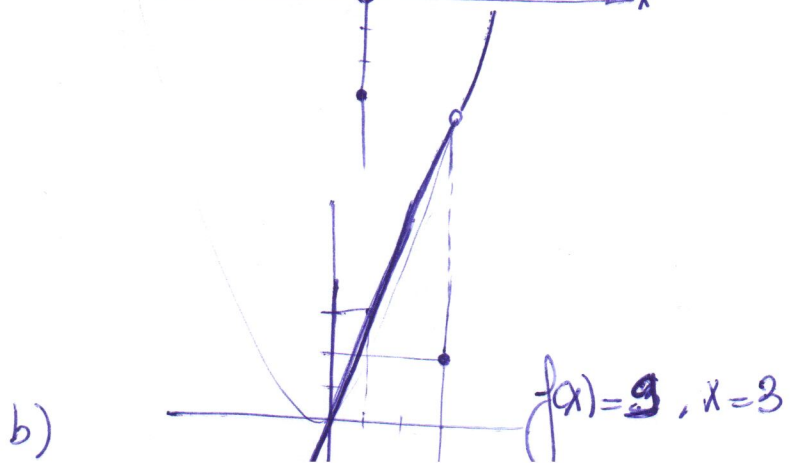
$$\rightarrow \boxed{f^{-1}(x) = 3x-2}$$

COMP. $(f \circ f^{-1})(x) = f(f^{-1}(x)) = f(3x-2) = \frac{3x+2+2}{3} = x$ ✓

Obs. Precho porque es una función inyectiva (recta).



$$f(x) = 1, x = 0$$



$$f(x) = 9, x = 3$$

b)

Pg. 195

$$\begin{aligned} \textcircled{40} \quad f(x) &= x^2 - 3x && \rightarrow \text{Dom}(f) = \mathbb{R} \\ g(x) &= 2x + 2 && \rightarrow \text{Dom}(g) = \mathbb{R} \\ h(x) &= \frac{x-4}{2} && \rightarrow \text{Dom}(h) = \mathbb{R} \end{aligned}$$

a) $\text{Dom}(f+g) = \mathbb{R}$

$$f(x) + g(x) = x^2 - 3x + 2x + 2 = x^2 - x + 2$$

b) $\text{Dom}(g-h) = \mathbb{R}$

$$g(x) - h(x) = 2x + 2 - \frac{x-4}{2} = \frac{4x+4-x+4}{2} = \frac{3x+8}{2}$$

c) $\text{Dom}(f \cdot h) = \mathbb{R}$

$$f(x) \cdot h(x) = (x^2 - 3x) \cdot \frac{x-4}{2} = \frac{x^3 - 4x^2 - 3x^2 + 12x}{2} = \frac{x^3 - 7x^2 + 12x}{2}$$

d) $\text{Dom}\left(\frac{f}{g}\right) = \mathbb{R} - \{-1\}$

$$\frac{f(x)}{g(x)} = \frac{x^2 - 3x}{2x + 2}$$

e) $\text{Dom}(-g \cdot 3f) = \mathbb{R}$

$$\begin{aligned} -g(x) \cdot 3f(x) &= (-2x-2)(2x^2-9x) = (-6x^3 + 18x^2 - 6x^2 + 18x) \\ &= -6x^3 + 12x^2 + 18x \end{aligned}$$

f) $4h(x) - g(x) = 2(x-4) - (2x+2) = 2x-8-2x-2 = -10 \rightarrow \text{Dom} = \mathbb{R}$

41

$$f(x) = 4x + 3$$

$$g(x) = x^2 - 2$$

$$h(x) = \sqrt{x+4}$$

a) $(f \circ g)(x) = f(g(x)) = f(x^2 - 2) = 4(x^2 - 2) + 3 = 4x^2 - 8 + 3 = 4x^2 - 5$

b) $(g \circ f)(x) = g(f(x)) = g(4x + 3) = (4x + 3)^2 - 2 = 16x^2 + 24x + 9 - 2 = 16x^2 + 24x + 7$

c) $(h \circ f)(x) = h(f(x)) = h(4x + 3) = \sqrt{4x + 3 + 4} = \sqrt{4x + 7}$

d) $(g \circ h)(x) = g(h(x)) = g(\sqrt{x+4}) = (\sqrt{x+4})^2 - 2 = x + 4 - 2 = x + 2$

e) $(f \circ f)(x) = f(f(x)) = f(4x + 3) = 4(4x + 3) + 3 = 16x + 12 + 3 = 16x + 15$

f) $(g \circ g)(x) = g(g(x)) = g(x^2 - 2) = (x^2 - 2)^2 - 2 = x^4 - 4x^2 + 4 - 2 = x^4 - 4x^2 + 2$

42

a) $f(x) = -5x - 2 \rightarrow y = -5x - 2$

$$x = -5y - 2 \rightarrow 5y = -x - 2$$

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

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

$(f^{-1} \circ f)(x) = f^{-1}(f(x)) = f^{-1}(-5x - 2) = -5\left(\frac{-5x - 2}{5}\right) - 2 = +x + 2 - 2 = x \checkmark$

$$b) f(x) = \frac{x-3}{7} \rightarrow y = \frac{x-3}{7}$$

$$x = \frac{y-3}{7}$$

$$y = 7x+3 \Rightarrow f^{-1}(x) = 7x+3$$

$$f(f^{-1}(x)) = f(f^{-1}(x)) = f(7x+3) = \frac{7x+3-3}{7} = x \checkmark$$

$$c) f(x) = x^2 - 6 \rightarrow y = x^2 - 6$$

$$x = \sqrt{y+6}$$

$$y = \sqrt{x+6} \Rightarrow f^{-1}(x) = \sqrt{x+6}$$

$$f(f^{-1}(x)) = f(f^{-1}(x)) = f(\sqrt{x+6}) = (\sqrt{x+6})^2 - 6 = x+6-6 = x \checkmark$$

NO
inject

43

$$f(x) = 3x$$

$$a) y = 3x \rightarrow x = \frac{y}{3} \rightarrow y = \frac{x}{3} \Rightarrow f^{-1}(x) = \frac{x}{3}$$

$$b) f(f^{-1}(x)) = f(f^{-1}(x)) = f\left(\frac{x}{3}\right) = 3 \cdot \frac{x}{3} = x \checkmark$$

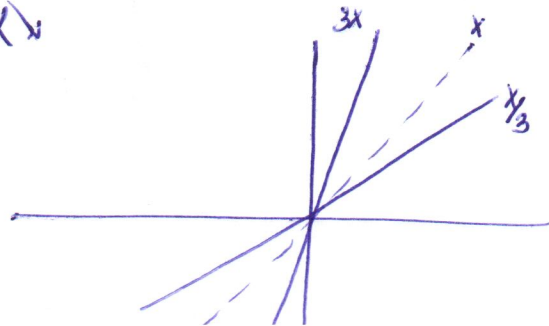


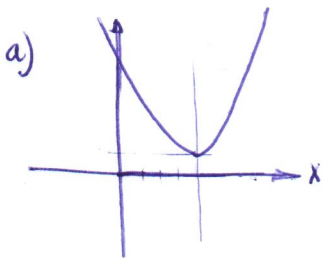
Fig. 215.

9) a) $m = \frac{0 - (-5)}{5 - 0} = \frac{5}{5} = 1$

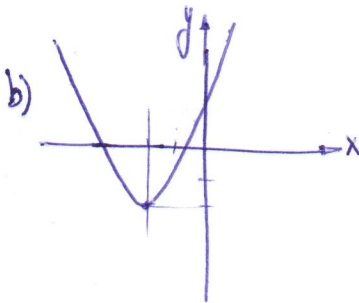
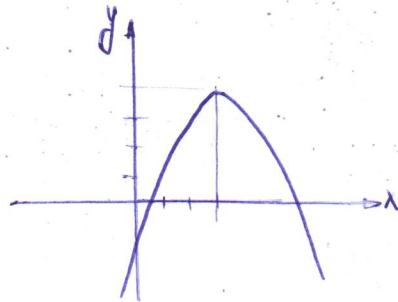
c) $m = \frac{-2 + 3}{\frac{1}{3} - 2} = \frac{1}{\frac{1-6}{3}} = \frac{3}{-5}$

b) $m = \frac{-5 - (-2)}{-2 - 3} = \frac{-5 + 2}{-5} = \frac{3}{5}$

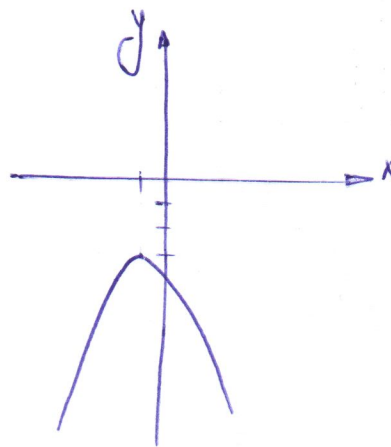
10)



c)



d)



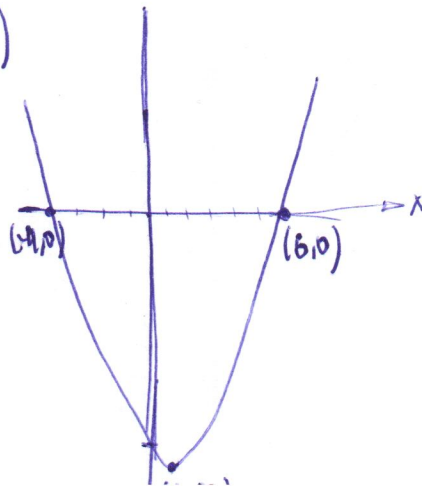
11)

b) $y = x^2 - 2x - 24$

Vért. $x_v = \frac{-b}{2a} = \frac{2}{2} = 1 \rightarrow y_v = 1^2 - 2 - 24 = -25$ $V(1, -25)$

Cortes $\left\{ \begin{array}{l} \text{H} \text{e} X \text{. } (y=0) \rightarrow x^2 - 2x - 24 = 0 \rightarrow \begin{cases} x=6 \\ x=-4 \end{cases} \quad (-4, 0) \text{ y } (6, 0) \\ \text{H} \text{e} Y \text{. } (x=0) \rightarrow y = -24 \Rightarrow (0, -24) \end{array} \right.$

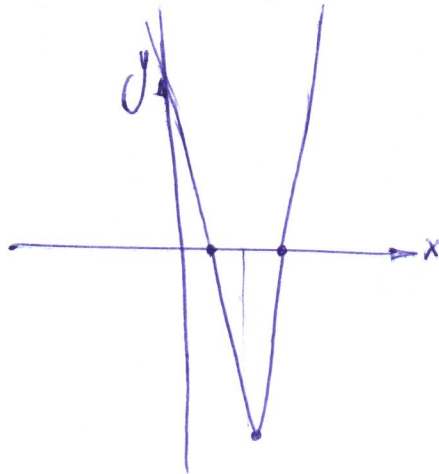
$\text{H} \text{e} Y \text{. } (x=0) \rightarrow y = -24 \Rightarrow (0, -24)$



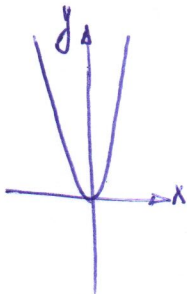
c) $y = 2x^2 - 8x + 6$

Vertex: $x_v = \frac{-b}{2a} = \frac{8}{4} = 2$, $y_v = 2 \cdot 2^2 - 8 \cdot 2 + 6 = 8 - 16 + 6 = -2$ $V(2, -2)$

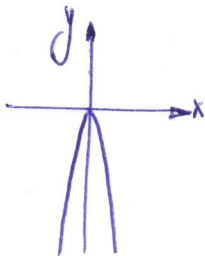
Cartes: $\left\{ \begin{array}{l} \text{H} \text{ in } x: y=0, 2x^2 - 8x + 6 = 0 \quad x = \left\langle \frac{3}{1} \right\rangle \quad (1,0) \text{ y } (3,0) \\ \text{H} \text{ in } y: x=0, y=6 \quad (0,6) \end{array} \right.$



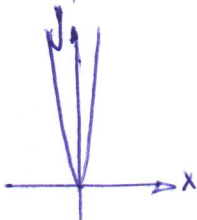
14 a)



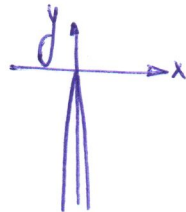
c)



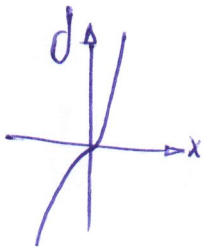
b)



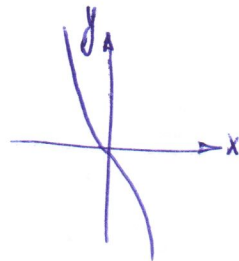
d)



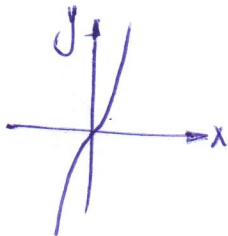
15 a)



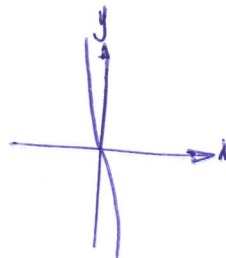
c)



b)

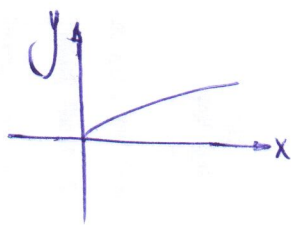


d)

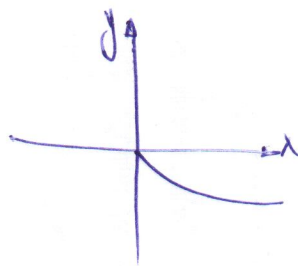


16

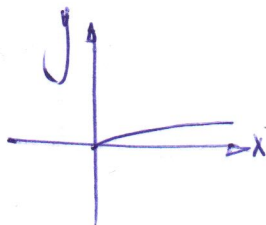
a)



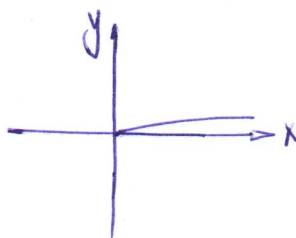
c)



b)

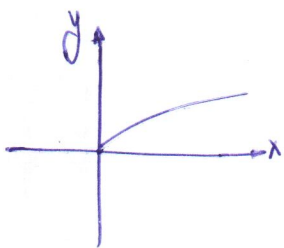


d)

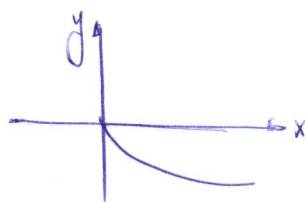


17

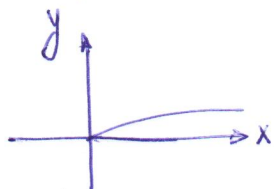
a)



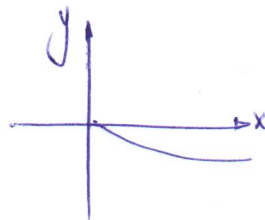
c)



b)

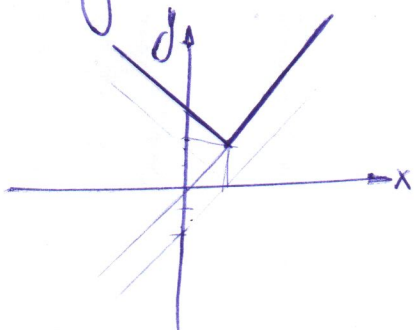


d)

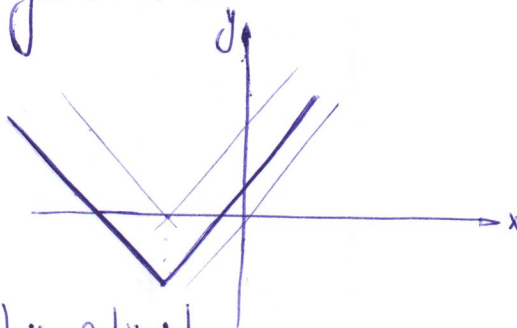


20

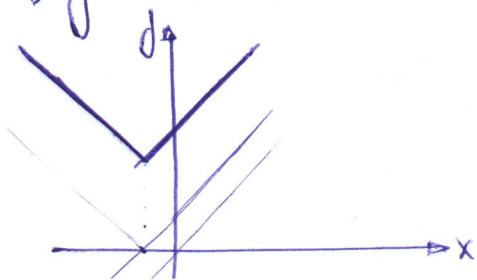
a) $y = |x-2| + 2$



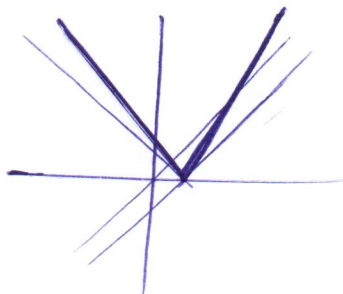
c) $y = |x+4| - 3$



b) $y = |x+1| + 5$

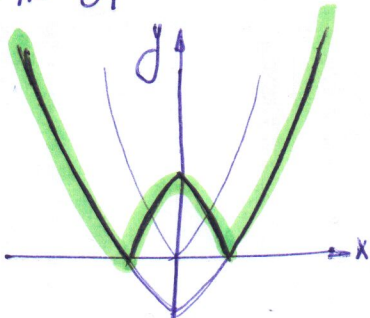


d) $y = 2|x-1|$

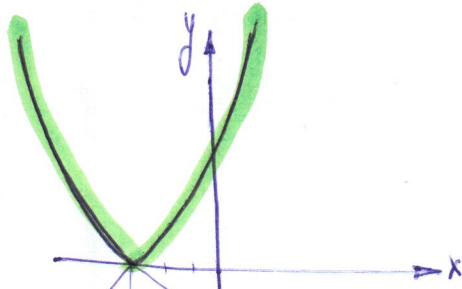


21

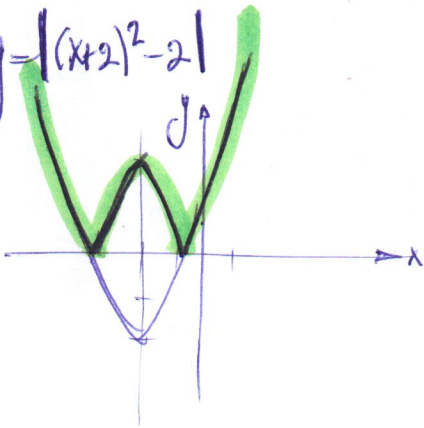
a) $y = |x^2 - 3|$



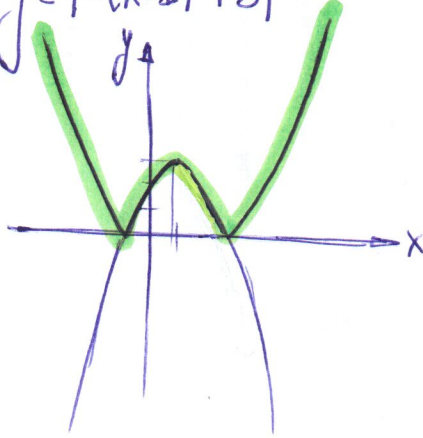
c) $y = |-(x+3)^2|$



b) $y = |(x+2)^2 - 2|$

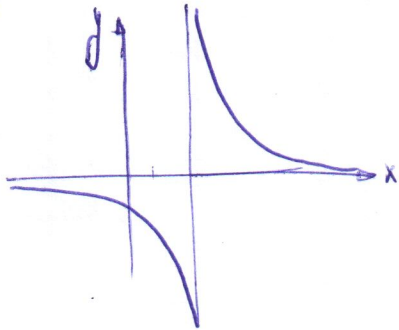


d) $y = |-(x-1)^2 + 3|$

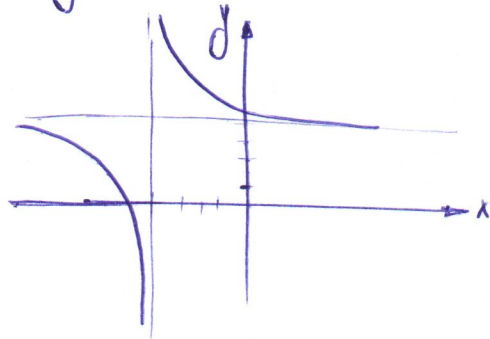


23

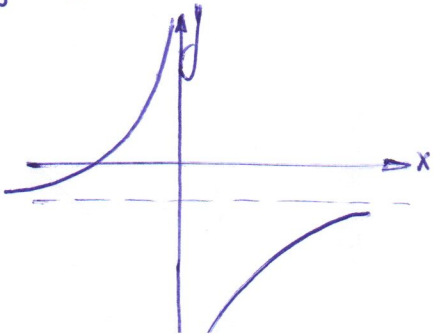
a) $y = \frac{1}{x-2}$



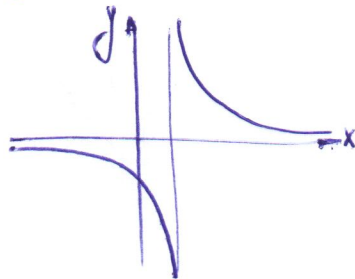
c) $y = \frac{1}{x+4} + 5$



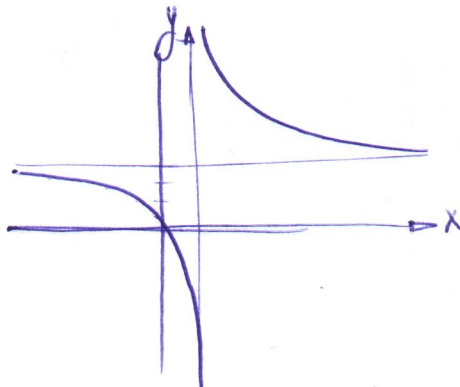
b) $y = \frac{-2}{x} - 1$



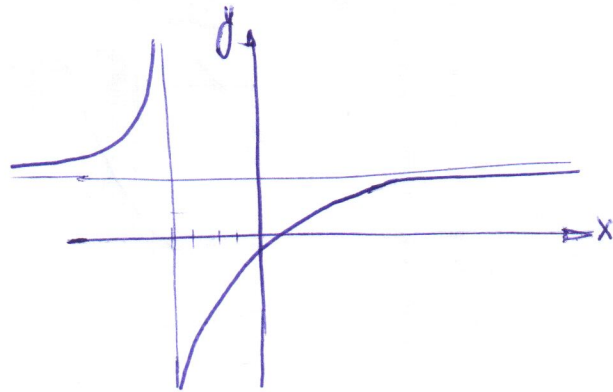
d) $y = \frac{2}{x-1}$



$$e) y = \frac{3x+5}{x-1} = 3 + \frac{2}{x-1}$$

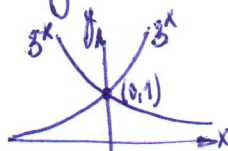


$$f) y = \frac{2x-1}{x+4} = 2 - \frac{9}{x+4}$$

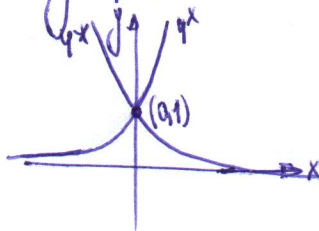


24

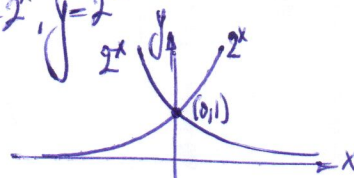
$$a) y = 3^x, y = \left(\frac{1}{3}\right)^x$$



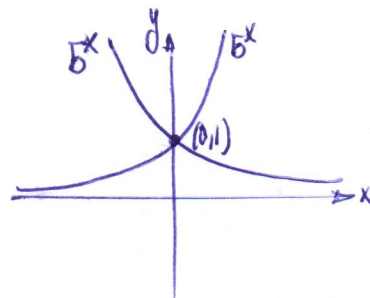
$$b) y = 4^x, y = \left(\frac{1}{4}\right)^x$$



$$c) y = 2^x, y = \frac{1}{2^x}$$

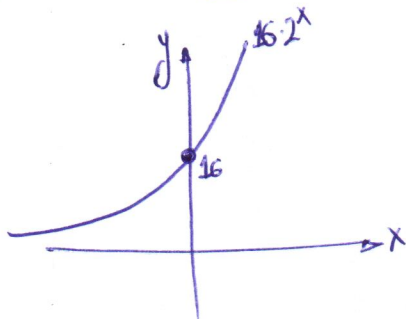


$$d) y = \left(\frac{1}{5}\right)^x, y = 5^x$$

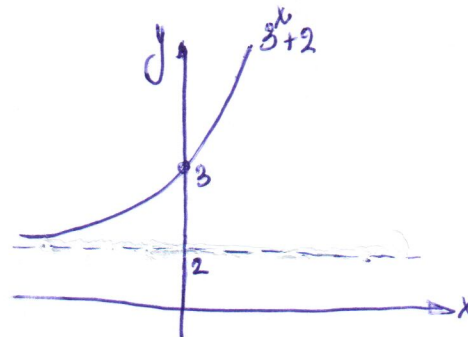


26

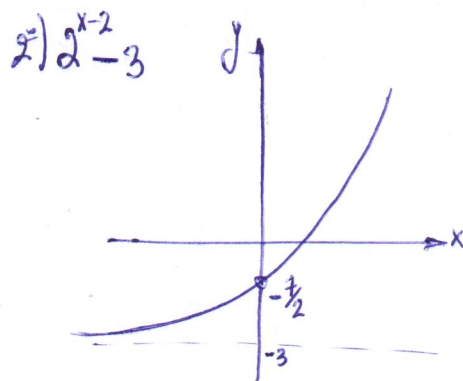
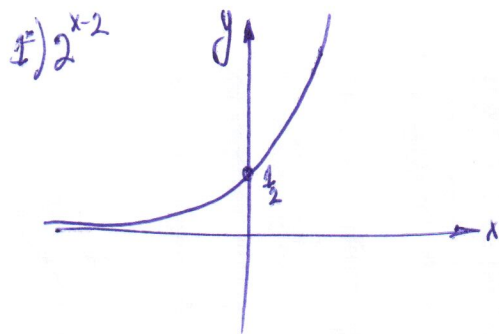
$$a) y = 2^{x+4} = 2^4 \cdot 2^x = 16 \cdot 2^x \leftarrow \text{cambia el pto de corte}$$



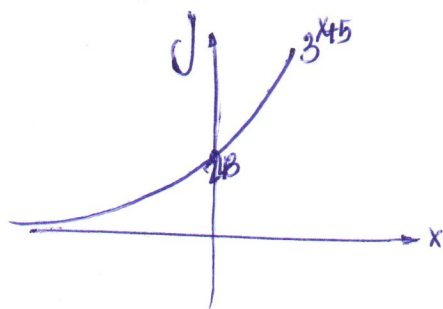
$$b) y = 3^x + 2$$



$$c) y = 2^{x-2} - 3$$

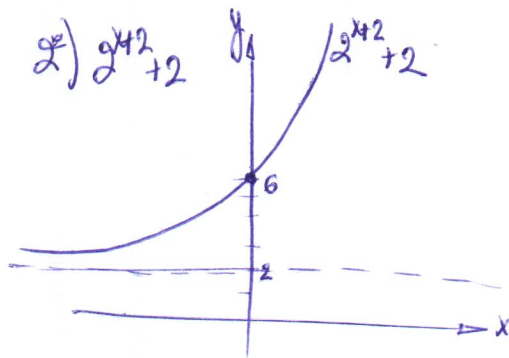
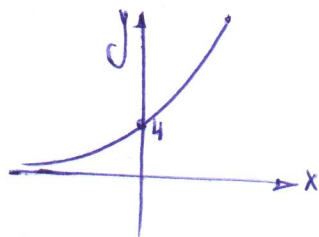


$$d) y = 3^{x+5} = 3^5 \cdot 3^x = 243 \cdot 3^x$$



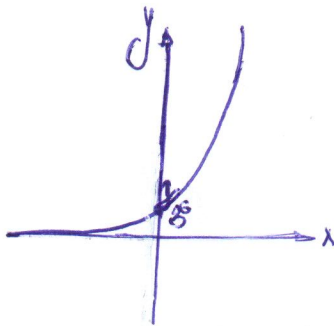
$$e) y = 2^{x+2} + 2$$

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

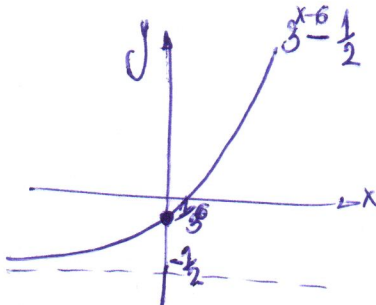


$$f) y = 3^{x-6} - \frac{1}{2}$$

$$1.) 3^{x-6} = \frac{3^x}{3^6}$$

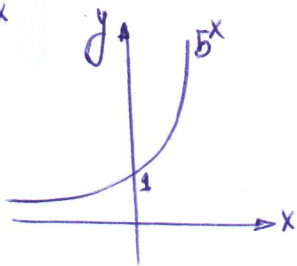


$$2.) 3^{x-6} - \frac{1}{2}$$

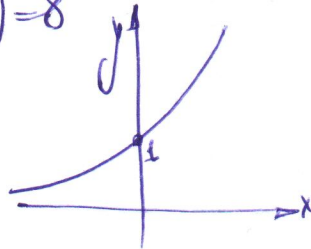


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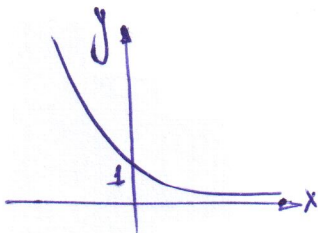
$$a) y = 5^x$$



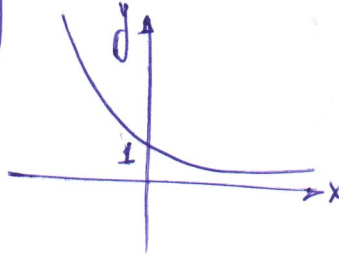
$$c) y = \left(\frac{1}{8}\right)^x = 8^{-x}$$



$$b) y = 4^{-x}$$

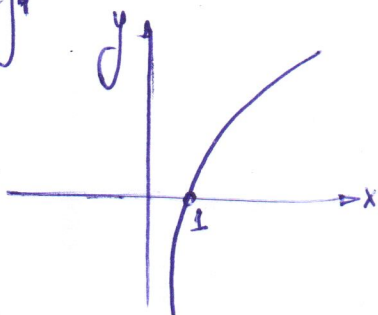


$$d) y = \left(\frac{1}{6}\right)^x = 6^{-x}$$

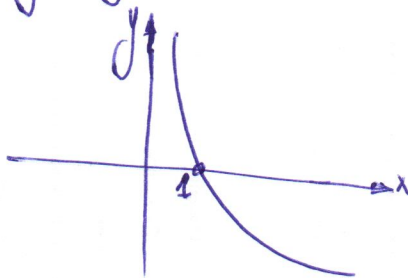


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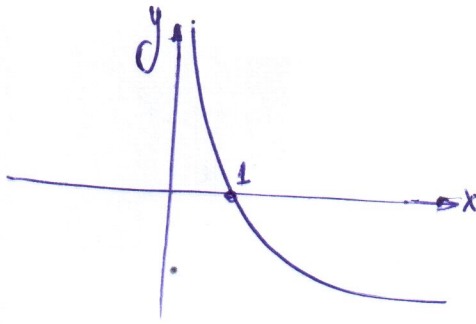
$$a) y = \log_4 x$$



$$b) y = \log_{\frac{1}{5}} x$$

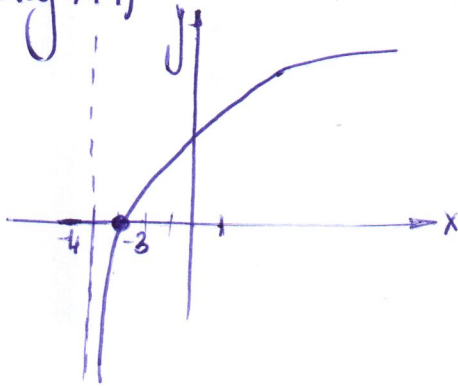


$$d) y = \log_{\frac{1}{3}} x$$

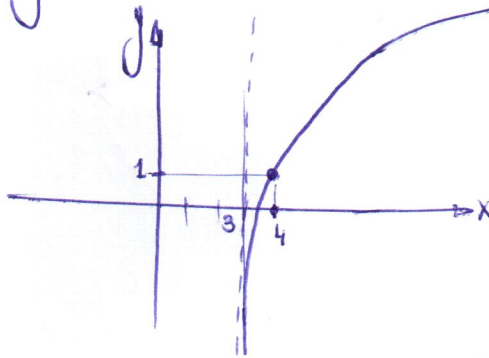


(25)

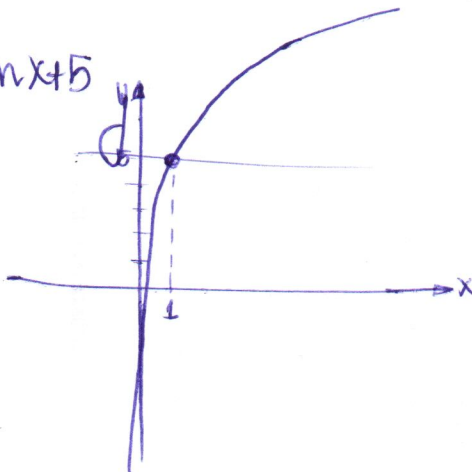
$$a) y = \log(x+4)$$



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



$$c) y = \ln x + 5$$



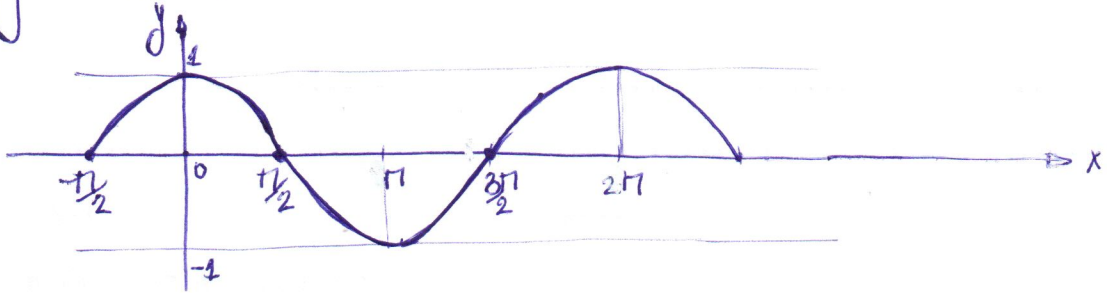
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- a) 3
- b) 4
- c) 1

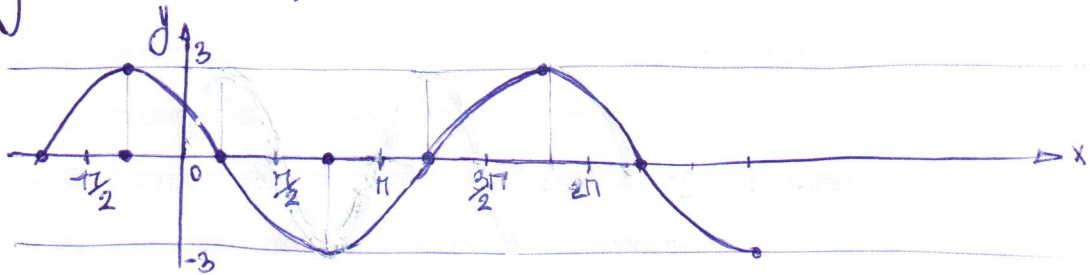
- d) 5
- e) 2

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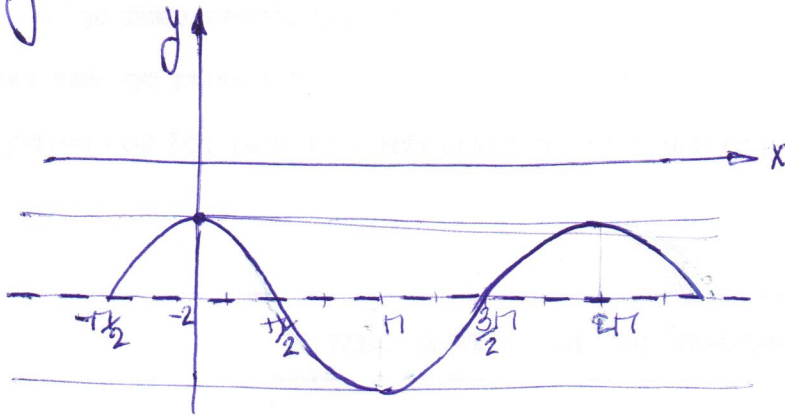
a) $y = \sin(x + \pi)$



b) $y = 3 \cdot \cos(x + \pi/2)$



c) $y = \cos(x + 4\pi) - 2$



d) $y = \cos(x + \pi) - 4$

