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What to say in front of the blackboard  
- a brief tutorial.

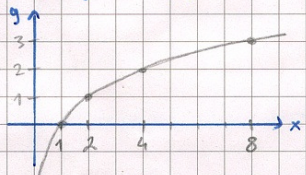
Exercise: Draw the graph of:

a)  $f(x) = |\log_2 |x+1||$

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

(each step separately). State the domain and the co-domain of each function.

a) 1.  $y_1 = \log_2 x$

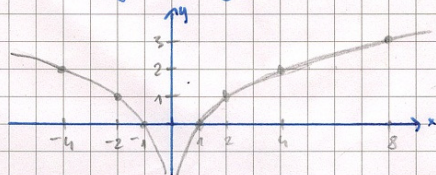


I start with the logarithm of  $x$  with base 2

$$D_{y_1} = (0, \infty)$$

$$D_{y_1}^{-1} = \mathbb{R}$$

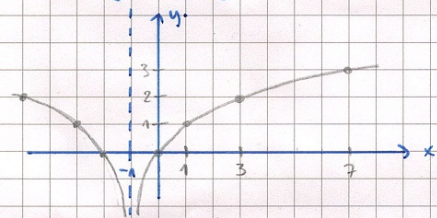
2.  $y_2 = \log_2 |x|$



To obtain the absolute value I flipped the previous graph

$$D_{y_2} = \mathbb{R} \setminus \{0\}, \quad D_{y_2}^{-1} = \mathbb{R}$$

3.  $y_3 = \log_2 |x+1|$

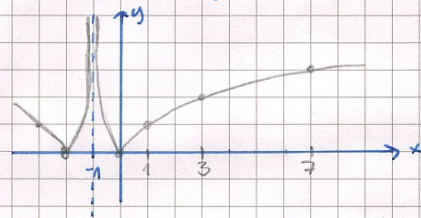


I move my previous graph by 1 to the left.

$$D_{y_3} = \mathbb{R} \setminus \{-1\}$$

$$D_{y_3}^{-1} = \mathbb{R}$$

4.  $y_4 = |\log_2 |x+1||$

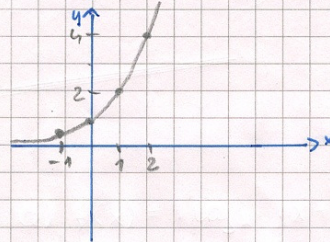


To obtain the absolute value, the negative part of the previous graph goes up.

$$D_{y_4} = \mathbb{R} \setminus \{-1\}$$

$$D_{y_4}^{-1} = [0, \infty)$$

b) 1.  $y_1 = 2^x$

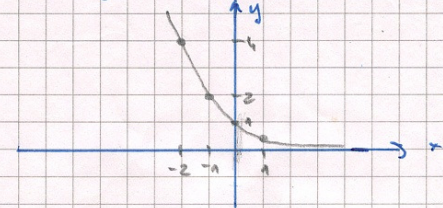


I start with a 2 to the power of  $x$ .

$$D_{y_1} = (-\infty, \infty)$$

$$D_{y_1}^{-1} = (0, \infty)$$

2.  $y_2 = 2^{-x}$

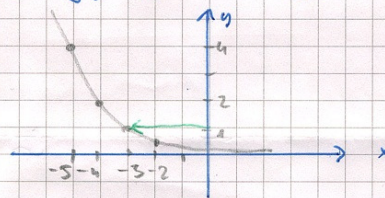


I flipped the previous graph horizontally.

$$D_{y_2} = (-\infty, \infty)$$

$$D_{y_2}^{-1} = (0, \infty)$$

3.  $y_3 = 2^{-(x+3)} = 2^{-x-3}$

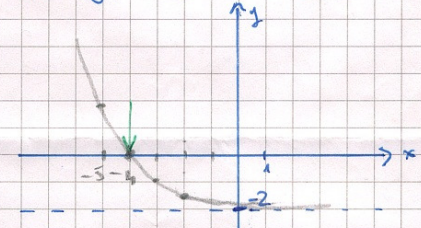


I move the previous graph by 3 to the left.

$$D_{y_3} = (-\infty, \infty)$$

$$D_{y_3}^{-1} = (0, \infty)$$

4.  $y_4 = 2^{-(x+3)} - 2$



I move the previous graph by 2 down.

$$D_{y_4} = (-\infty, \infty)$$

$$D_{y_4}^{-1} = [-2, \infty)$$