

Homework 2.1

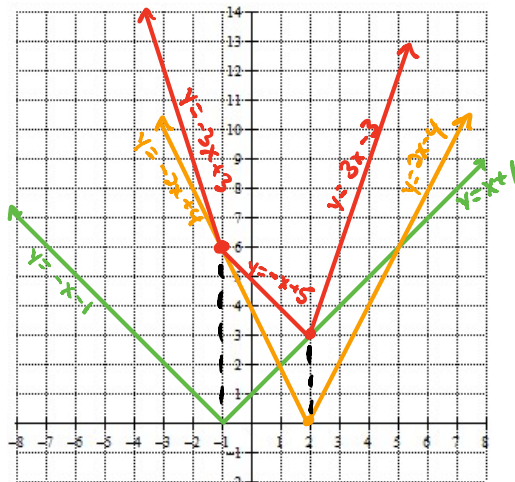
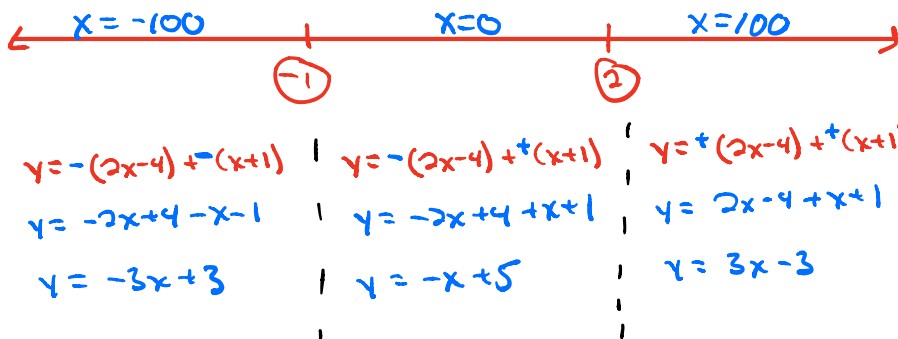
1. Rewrite the function $g(x) = |2x - 4| + |x + 1|$ as a piece-wise defined function without absolute value bars. Then, graph $g(x)$ on the grid to the right.

$$= |2(x-2)| + |x+1|$$

$$2x-4=0 \quad x+1=0$$

$$2x=4 \quad x=-1$$

$$x=2$$



$$g(x) = \begin{cases} -3x+3, & x < -1 \\ -x+5, & -1 \leq x \leq 2 \\ 3x-3, & x > 2 \end{cases}$$

2. Rewrite the function $h(x) = \frac{-2|x-3|+|x+3|}{x+1}$ as a piece-wise defined function without absolute value bars.

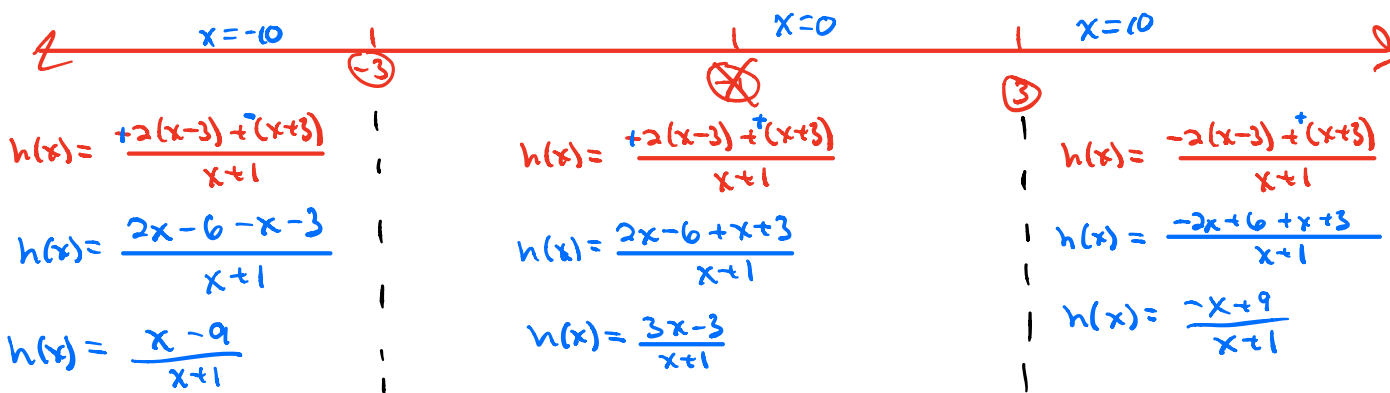
$$x-3=0 \quad x+3=0$$

$$x=3 \quad x=-3$$

Denom $\neq 0$

$$x+1 \neq 0$$

$$x \neq -1$$



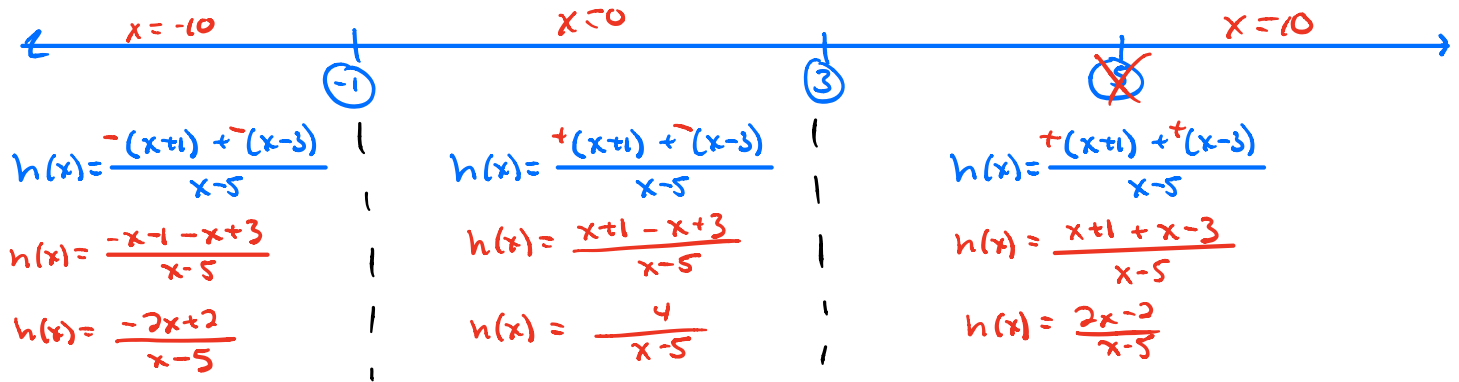
$$h(x) = \begin{cases} \frac{x-9}{x+1}, & x \leq -3 \\ \frac{3x-3}{x+1}, & -3 < x < 3, \quad x \neq -1 \\ \frac{-x+9}{x+1}, & x \geq 3 \end{cases}$$

3. Rewrite the function $h(x) = \frac{|x+1|+|x-3|}{x-5}$ as a piece-wise defined function without absolute value bars.

$$\begin{aligned} x+1 &= 0 \\ x &= -1 \end{aligned}$$

$$\begin{aligned} x-3 &= 0 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} \text{Denom} &\neq 0 \\ x-5 &\neq 0 \\ x &\neq 5 \end{aligned}$$



$$h(x) = \begin{cases} \frac{-2x+2}{x-5}, & x < -1 \\ \frac{4}{x-5}, & -1 \leq x \leq 3 \\ \frac{2x-2}{x-5}, & x > 3, x \neq 5 \end{cases}$$