4.1/4.2 Piecewise Functions

Vocabulary

Piecewise Function - Looks like different graphs put together. The equation is several equations listed together.

Domain - The x-values on graph from left to right.

Range - The y-values on graph from bottom to top.

Piecewise Functions

① Identify and mark domain restrictions/boundary.

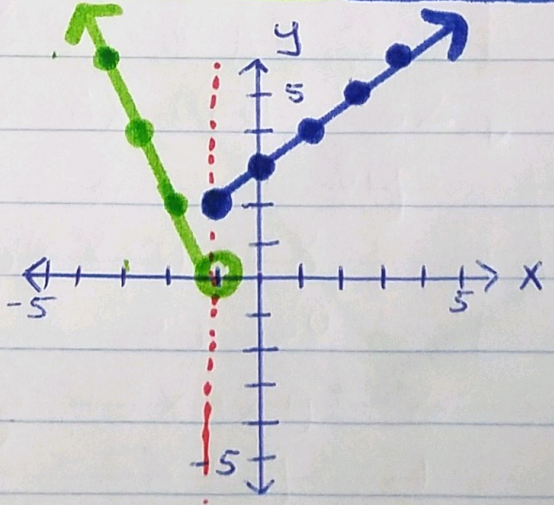
② Make an xy-table & graph

③ Identify domain & range of final graph.

Ex #1 $g(x) = \begin{cases} -2x-2 & \text{if } x < -1 \\ x+3 & \text{if } x \geq -1 \end{cases}$

$x = -1$ is the boundary

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
y	8	6	4	2	2	3	4	5	6	7	8



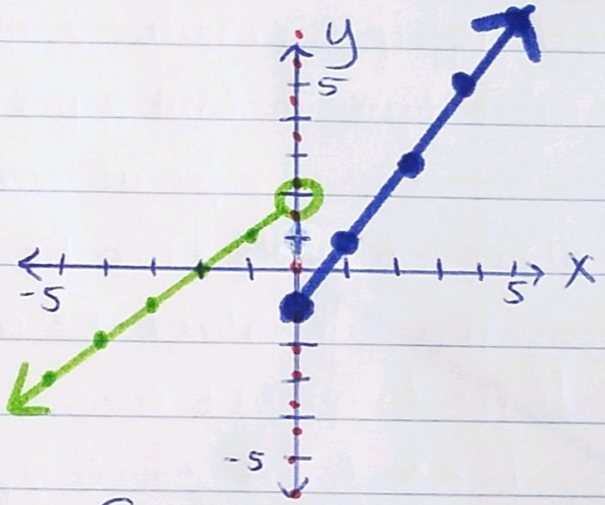
D: $(-\infty, \infty)$

R: $(0, \infty)$

Ex #2

$$f(x) = \begin{cases} x+2 & \text{if } x < 0 \\ 2x-1 & \text{if } x \geq 0 \end{cases}$$

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
y	-3	-2	-1	0	1	-1	1	3	5	7	9



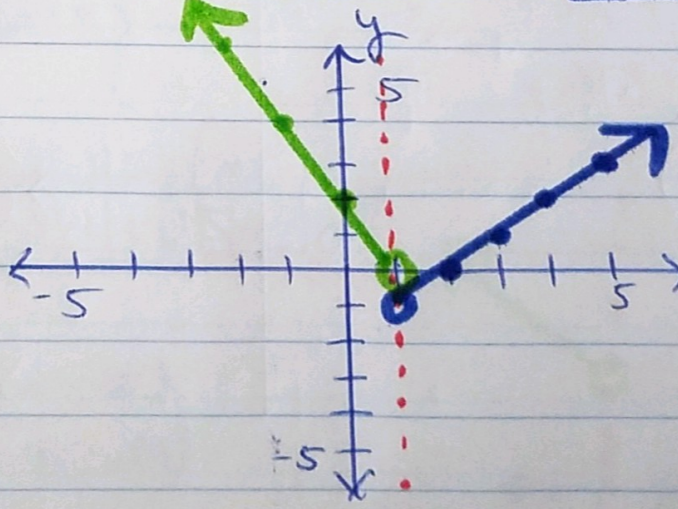
D: $(-\infty, \infty)$

R: $(-\infty, \infty)$

Ex #3

$$y = \begin{cases} -2x+2 & \text{if } x < 1 \\ x-2 & \text{if } x > 1 \end{cases}$$

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
y	12	10	8	6	4	2		0	1	2	3

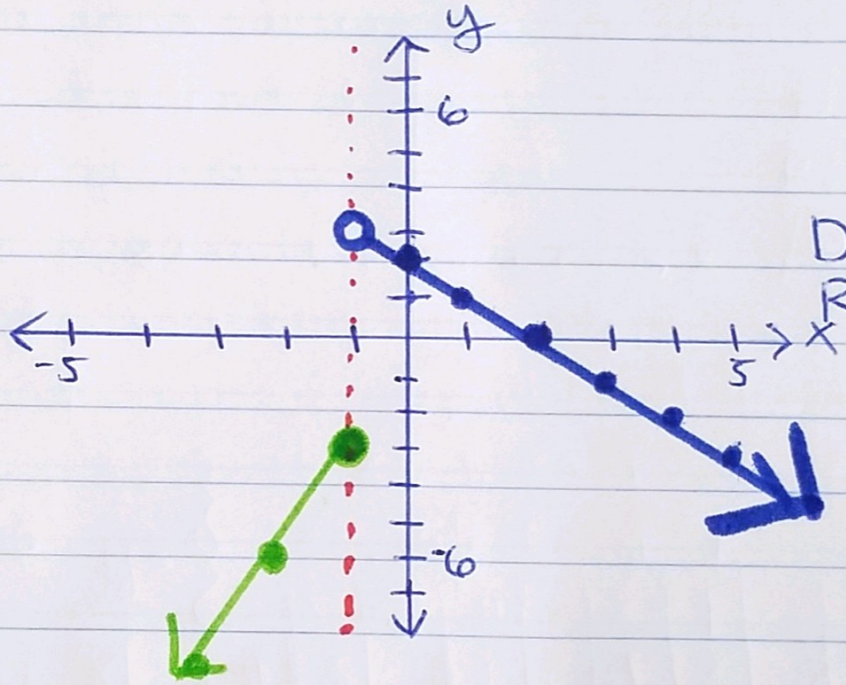


D: $(-\infty, 1) \cup (1, \infty)$

R: $(-1, \infty)$

EX #4 $f(x) = \begin{cases} 3x & \text{if } x \leq -1 \\ -x+2 & \text{if } x > -1 \end{cases}$

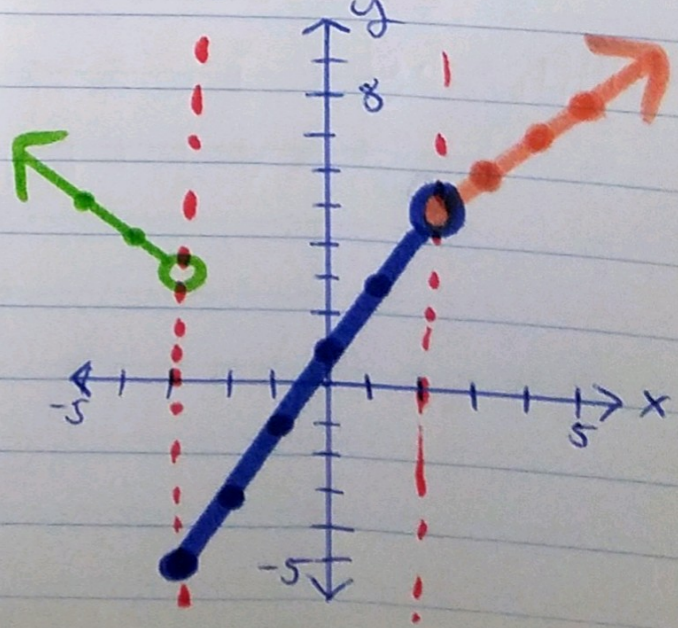
x	-5	-4	-3	-2	-1	0	1	2	3	4	5
y	-15	-12	-9	-6	-3	2	1	0	-1	-2	-3



D: $(-\infty, \infty)$
R: $(-\infty, 3)$

EX #5 $g(x) = \begin{cases} -x & \text{if } x < -3 \\ 2x+1 & \text{if } -3 \leq x < 2 \\ x+3 & \text{if } x \geq 2 \end{cases}$

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
y	5	4	-5	-3	-1	1	3	5	6	7	8



D: $(-\infty, \infty)$
R: $[-5, \infty)$