

2-3 Piecewise Functions

Objectives:

2.3a: I can graph a piecewise function

2.3b: I can write the equation of a piecewise function

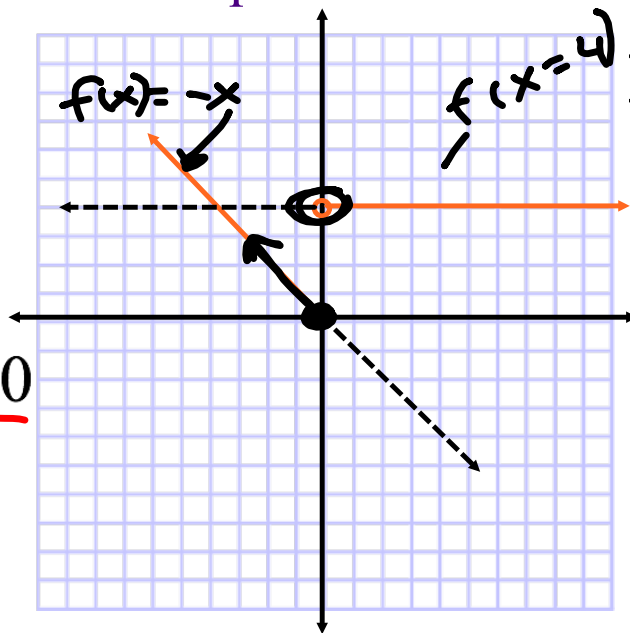
A piecewise function is a function with different equations defined over unique intervals of x .

For example:

$$f(x) = \begin{cases} -x, & x \leq 0 \\ 4, & x > 0 \end{cases}$$

• $f(x)$

• $f(x) = 4$

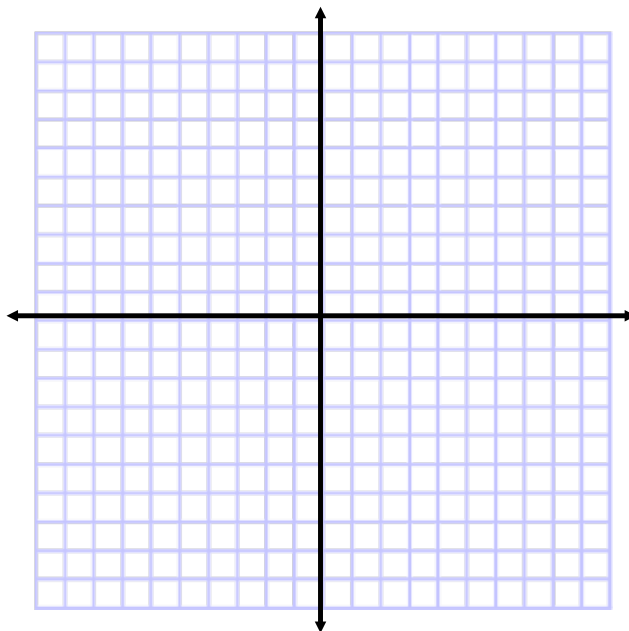


| x | y |
|----|----|
| -2 | 2 |
| -1 | 1 |
| 0 | 0 |
| 1 | -1 |
| 2 | -2 |

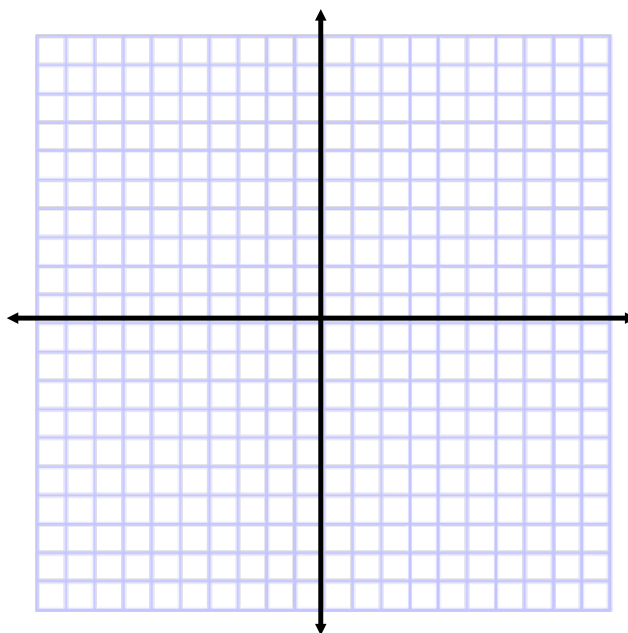
| x | y |
|---|---|
| 1 | 4 |
| 2 | 4 |
| 3 | 4 |
| 4 | 4 |

Graph the following:

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



$$f(x) = \begin{cases} x^3, & x < -1 \\ 2^x, & x > 0 \end{cases}$$



Graph.

$$f(x) = \begin{cases} x^2, & \underline{x \geq 0} \\ x^3, & \underline{x < 0} \end{cases}$$

$$f(x) = x^2$$

$$f(x) = x^3$$

Min $(-1, 1)$
Max: none

L: $x \rightarrow \infty,$
 $y \rightarrow \infty$

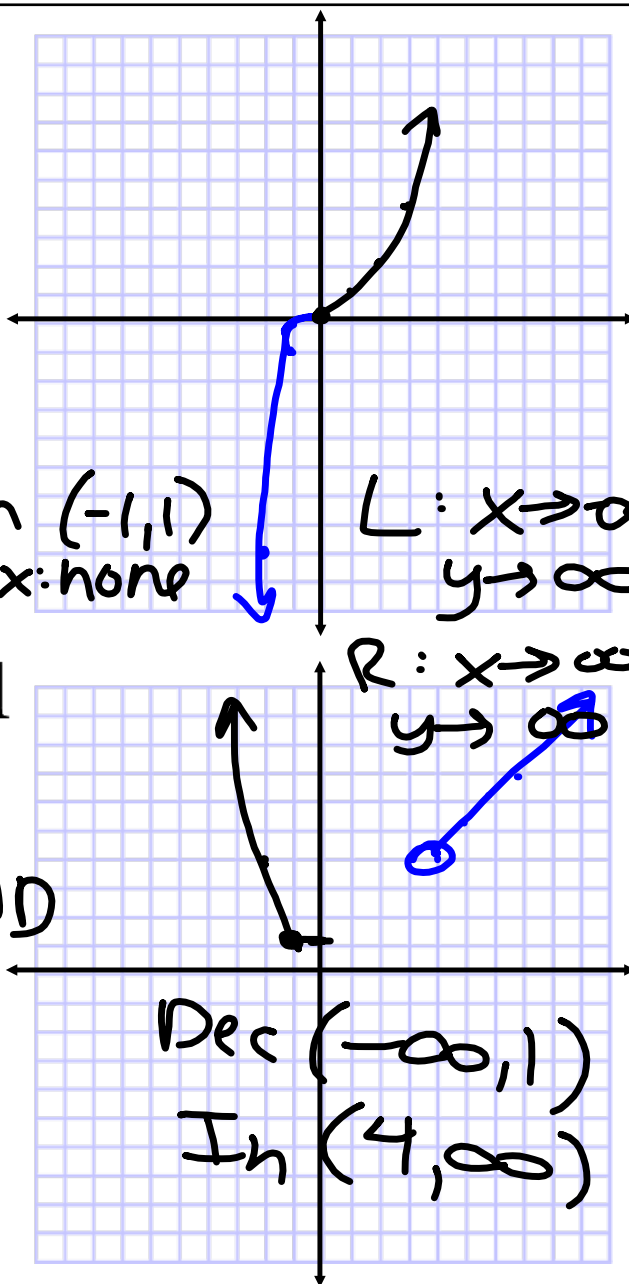
R: $x \rightarrow \infty,$
 $y \rightarrow \infty$

$$f(x) = \begin{cases} x^2, & x \leq -1 \\ x, & x > 4 \end{cases}$$

D: $(-\infty, -1]$ AND

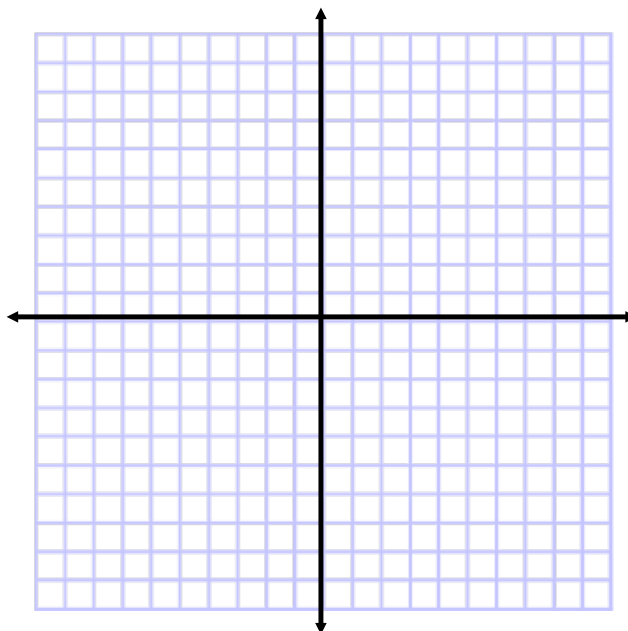
$(4, \infty)$
R: $[1, \infty)$

Dec $(-\infty, 1)$
In $(4, \infty)$

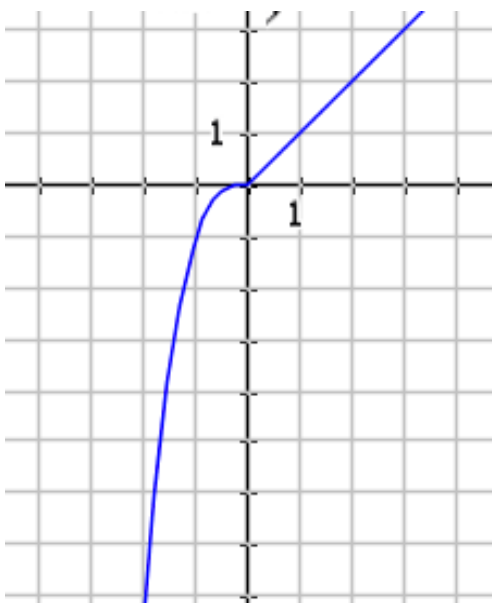


Graph.

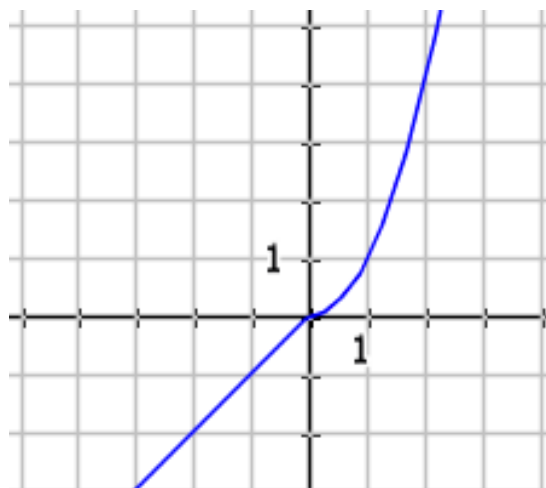
$$f(x) = \begin{cases} x, & x > 1 \\ 2^x, & x \leq 0 \end{cases}$$



Write the equation for the following piecewise functions



Write the equation for the following piecewise functions.



Graph

$$f(x) = \begin{cases} x^2, & -2 < x \leq 1 \\ x, & x > 2 \end{cases}$$

