

Notes 2-6A Special Functions
Algebra II

Name _____
Period _____

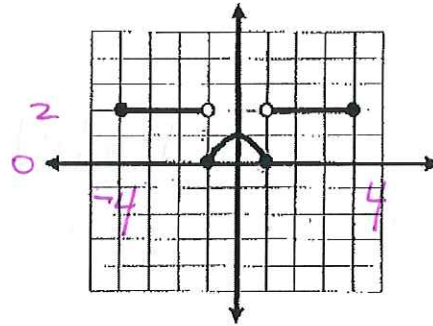
A **piecewise function** is a function that is defined by more than one equation. The rule for a piecewise function is different for different parts, or pieces, of the domain. Ex: ticket prices by age. Postal rates.

Example #1: The graph of a piecewise function is given.

1) Find:

$g(-1) = 0$ $g(1) = 0$

$g(0) = 1$ $g(3) = 2$



2) State the domain and range using interval notation.

D: $[-4, 4]$

R: $[0, 1] \cup [2]$

Example #2:

Find:

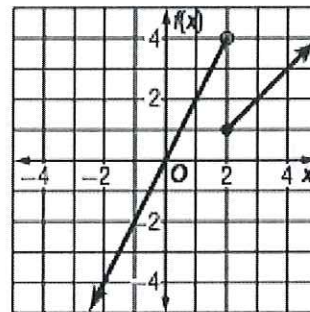
$f(-2) = -4$

$f(3) = 2$

$f(2) = 1$

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

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



A **step function** is an example of a piecewise function that is constant for each interval in its domain.

Example #3

$$f(x) = \begin{cases} 2, & \text{for } x < -3 \\ -4, & \text{for } x > -3 \end{cases}$$

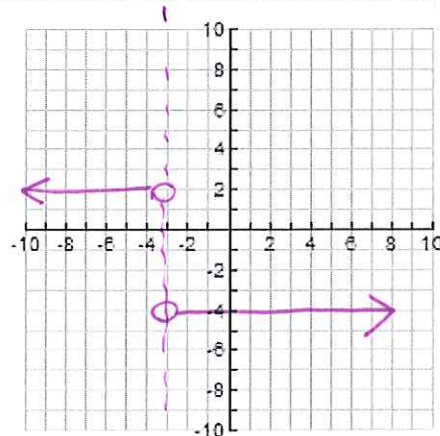
$f(-5) = 2$

$f(1) = -4$

$f(-3) = \text{undef}$

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

R: $\{2\} \cup \{-4\}$



Example #4:

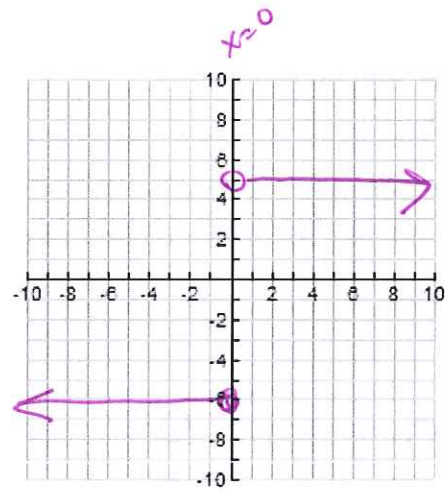
Ex: $f(x) = \begin{cases} -6, & \text{for } x \leq 0 \\ 5, & \text{for } x > 0 \end{cases}$

$f(-1) = \underline{-6}$

$f(6) = \underline{5}$

D: \mathbb{R}

R: $[-6] \cup [5]$



Graph each function. State the domain & range using interval notation.

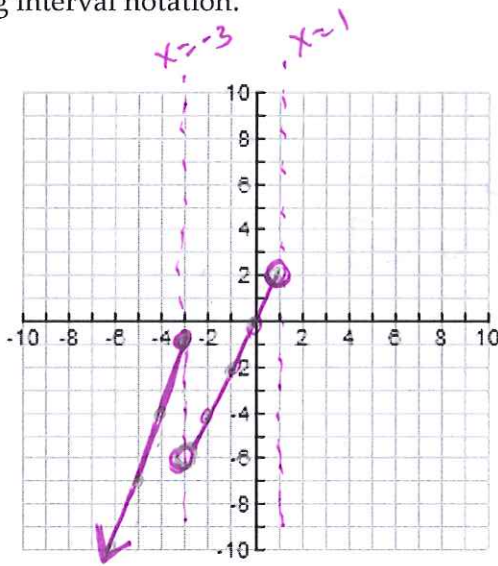
Example #5

$f(x) = \begin{cases} 3x + 8 & \text{for } x \leq -3 \\ -2x & \text{for } -3 < x < 1 \end{cases}$

$f(-4) = \underline{-4}$

$f(-3) = \underline{-1}$

$f(3) = \underline{\text{undefined}}$



Example #6

$f(x) = \begin{cases} \frac{3}{4}x + 1 & \text{for } x < 4 \\ \frac{3}{4}x - 2 & \text{for } x \geq 4 \end{cases}$

$f(-4) = \underline{-2}$

$f(8) = \underline{4}$

$f(4) = \underline{1}$

