

Piecewise Functions

First & Last Name: _____ Class: _____

If you did not get full points on the *Piecewise Functions* section of the “Pre-Review” test, attempt all of the (non-challenge) questions on this handout. Check your answers using the answer key. If you did not get a correct answer, use Khan Academy to review and master the topic.

Honor Students: you are expected to master the challenge questions.

Section 1: Evaluate piecewise functions (KA link)

1. What is $g(6)$ if

$$g(x) = \begin{cases} x^2 + 5 & \text{when } x \in (-\infty, -7) \\ 8x + 17 & \text{when } x \in [-7, 3] \\ (x - 1)(x + 6) & \text{when } x \in (3, \infty) \end{cases}$$

Since $6 \in (3, \infty)$, $g(6) = (6 - 1)(6 + 6) = 5(12) = 60$

2. What is $f(-8)$ if

$$f(t) = \begin{cases} t^2 - 2t & , t \leq -8 \\ t + 17 & , -8 < t < -3 \\ \frac{t^3}{t+10} & , t \geq 3 \end{cases}$$

If $t = -8$, then $t \leq -8$ is True and $f(-8) = (-8)^2 - 2(-8) = 64 + 16 = 80$

3. [Challenge] What is $h(0)$ if

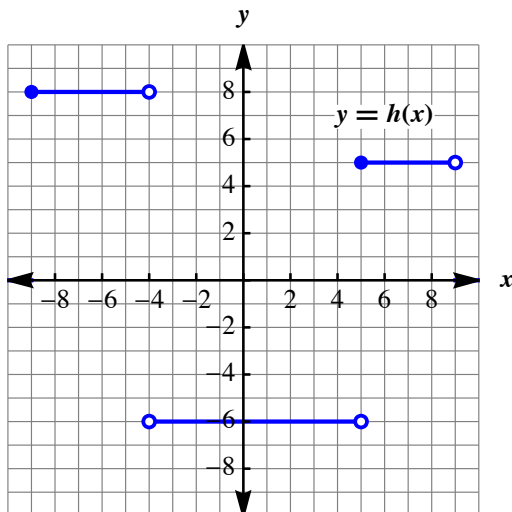
$$h(x) = \begin{cases} x^4 - \sqrt{6-x} & , x \leq -6 \\ 6 - x & , -6 < x < 0 \\ x^3 & , x > 0 \end{cases}$$

Since 0 is not in the domain of the function, $h(0) = \text{Undefined}$.

Section 2: Evaluate step functions (KA link)

1. Use the graph to evaluate:

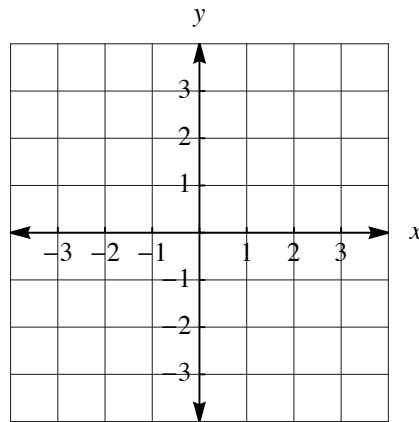
- $h(-4.0001) = 8$
- $h(-4) = \text{Undefined}$
- $h(-3.999) = -6$
- $h(5.0001) = 5$



Section 3: Piecewise functions graphs (KA link)

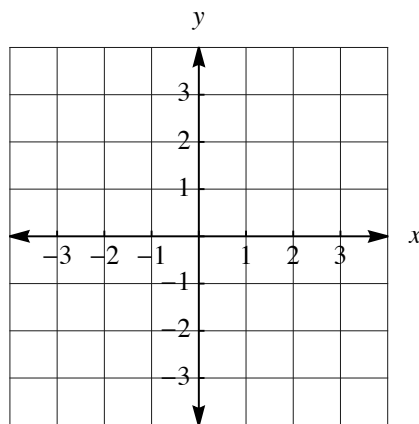
1. Graph the piecewise function

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



2. Graph the piecewise function

$$g(x) = \begin{cases} x+1 & x < -2 \\ 3 & -2 \leq x < 1 \\ -2x+4 & x \geq 1 \end{cases}$$



3. Write the piecewise function for the following graph:

