Name ___Key___
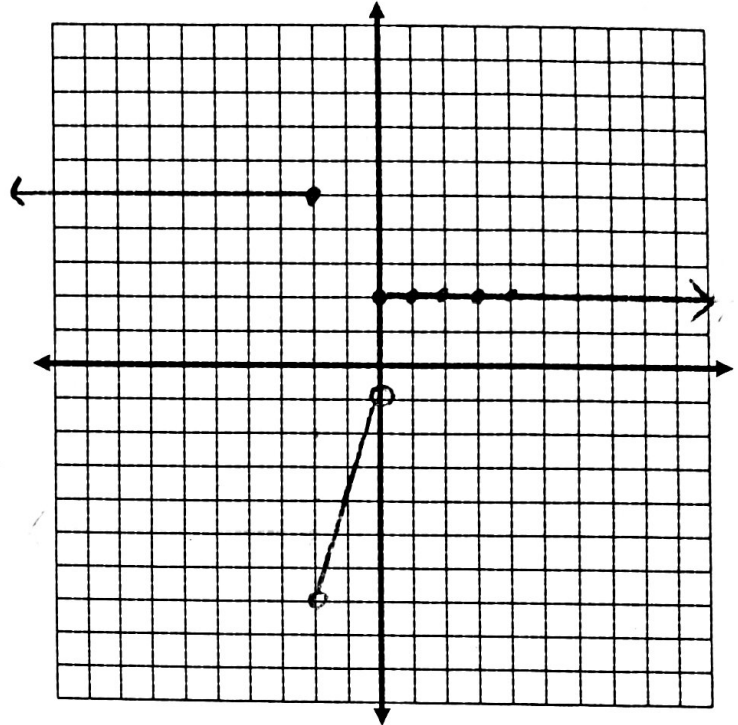
A piecewise function is a function that applies different function rules to various parts of the domain.

1. $f(x) = \begin{cases} 2 & \text{if } x \geq 0 \\ 3x - 1 & \text{if } -2 < x < 0 \\ 5 & \text{if } x \leq -2 \end{cases}$
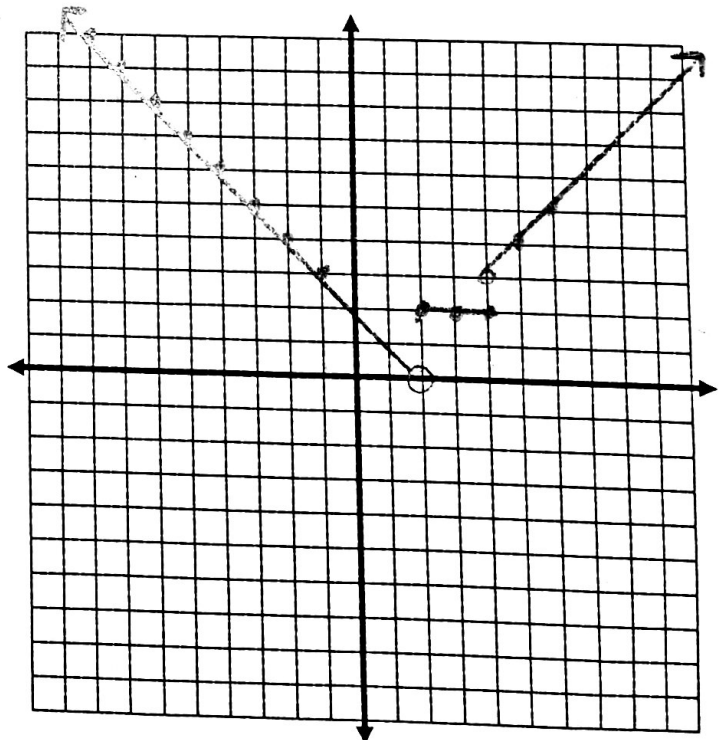
Sketch the graph of $y = f(x)$ below.

Find the following:

a. $f(-10) = $ ___5___

b. $f(-2) = $ ___5___

c. $f(-1.5) = $ ___-5.5___

d. $f(-1) = $ ___-4___

e. $f(0) = $ ___2___

f. $f(3) = $ ___2___

g. Domain: ___ℝ___

h. Range: ___$y = 2; -7 < y < -1; y = 5$___

i. Interval(s) of increasing:

___$-2 < x < 0$___

j. Interval(s) of decreasing:

___none___

2. $g(x) = \begin{cases} 2 - x & \text{if } x < 2 \\ 2 & \text{if } 2 \leq x \leq 4 \\ x - 1 & \text{if } x > 4 \end{cases}$

Sketch the graph of $y = g(x)$ below.

Find the following:

a. $f(-2) = $ ___4___

b. $f(0) = $ ___2___

c. $f(2) = $ ___2___

d. $f(3.5) = $ ___2___

e. $f(4) = $ ___2___

f. $f(10) = $ ___9___

g. Domain: ___ℝ___

h. Range: ___$y \geq 0$___

i. Interval(s) of increasing:

___$x \geq 4$___

j. Interval(s) of decreasing:

___$x < 0$___

3. $h(x) = \begin{cases} 3 - x & \text{if } x < 1 \\ 3x - 1 & \text{if } x \geq 1 \end{cases}$

Find the following function values:

a. $f(-5) = \underline{8}$

b. $f(-2.5) = \underline{5.5}$

c. $f(0) = \underline{3}$

d. $f(1) = \underline{2}$

e. $f(7) = \underline{20}$
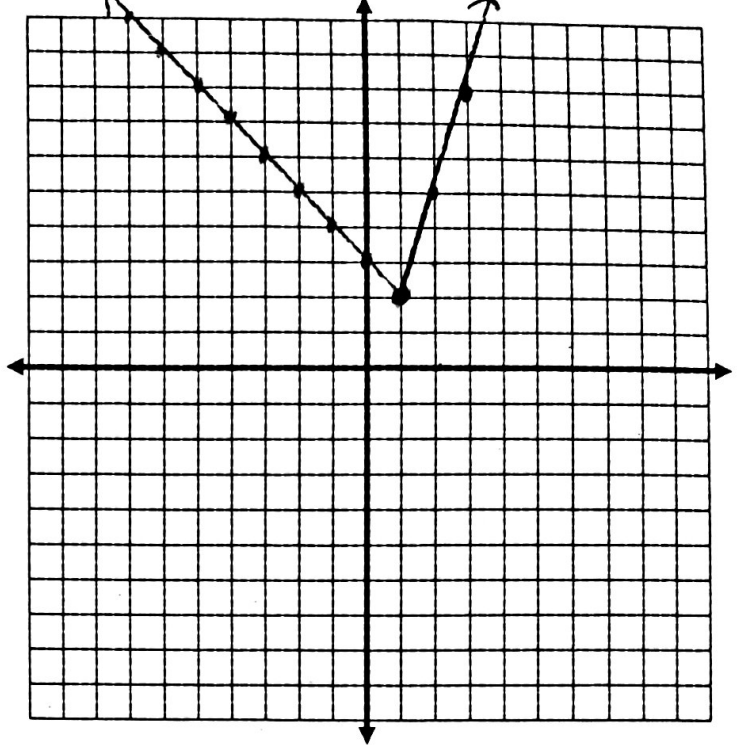
f. $f(85) = \underline{254}$

g. Domain: $\underline{R}$

h. Range: $\underline{y \geq 2}$

i. Interval(s) of increasing:

$\underline{X > 1}$

j. Interval(s) of decreasing:

$\underline{X < 1}$

Sketch the graph of $y = h(x)$ below.

4. $j(x) = \begin{cases} 2x + 7 & \text{if } -8 < x < 0 \\ 5 - x & \text{if } 0 \leq x \leq 3 \\ 8 & \text{if } 3 < x \leq 7 \end{cases}$

Find the following:

a. $f(-6) = \underline{-5}$

b. $f(2.5) = \underline{2.5}$

c. $f(0) = \underline{5}$

d. $f(3) = \underline{2}$

e. $f(7) = \underline{8}$

f. $f(-10) = \underline{\emptyset}$

g. Domain: $\underline{-8 < X \leq 7}$

h. Range of Step 1: $\underline{-9 < y < 7}$

i. Range of Step 2: $\underline{5 \leq y \leq 2}$