Using all of the information we know about a, b, h & k, we will graph Greatest Integer Functions and find the equation of a GIF from a given graph.

Examples: 1) Graph $f(x) = -2[3(x-1)]+4$

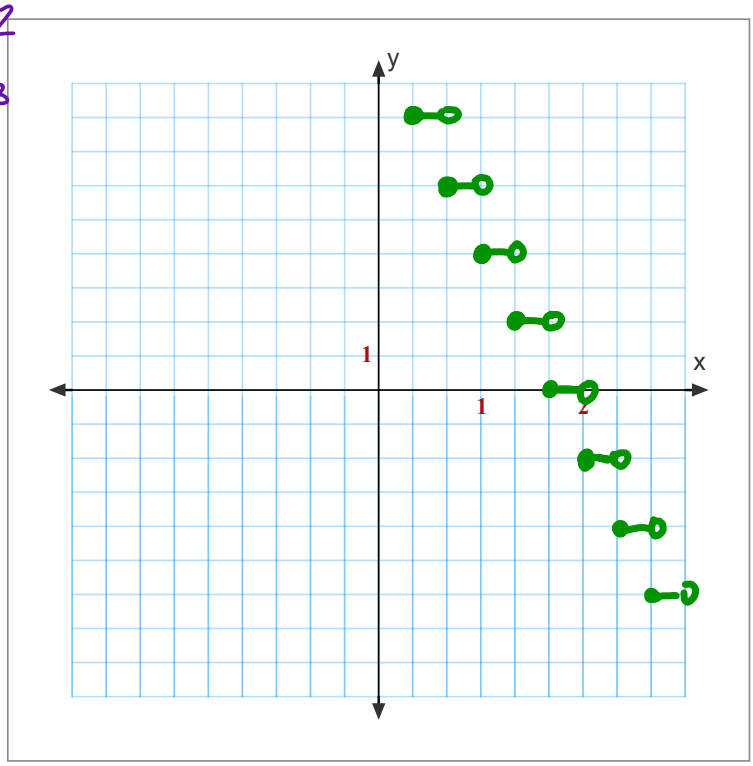
$a = -2$ $\Rightarrow$ countersteps = 2

$b = 3$ $\Rightarrow$ step length = $\frac{1}{3}$

a^-, b^+ decreasing

$h = 1$, $k = 4$ $\}$ $(1,4)$ solid point

$\hookrightarrow$ start



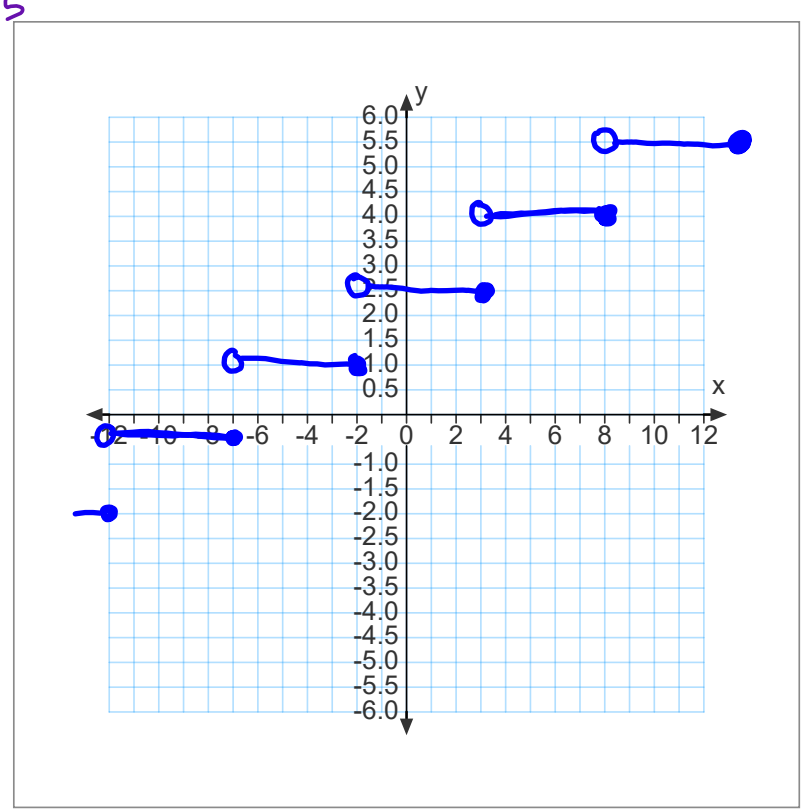
2) Graph $g(x) = -1.5\left[-\frac{1}{5}(x+7)\right] - 0.5$

$a = -1.5$ countersteps = 1.5

$b = -\frac{1}{5}$ step length = 5

a^-, b^- increasing

$h = -7$
$k = -0.5$ } solid point $(-7, -0.5)$



3) Graph $h(x)=3\left[\frac{x-2}{4}\right]+5$

$\frac{1}{4}(x-2)$

$b=\frac{1}{4}$

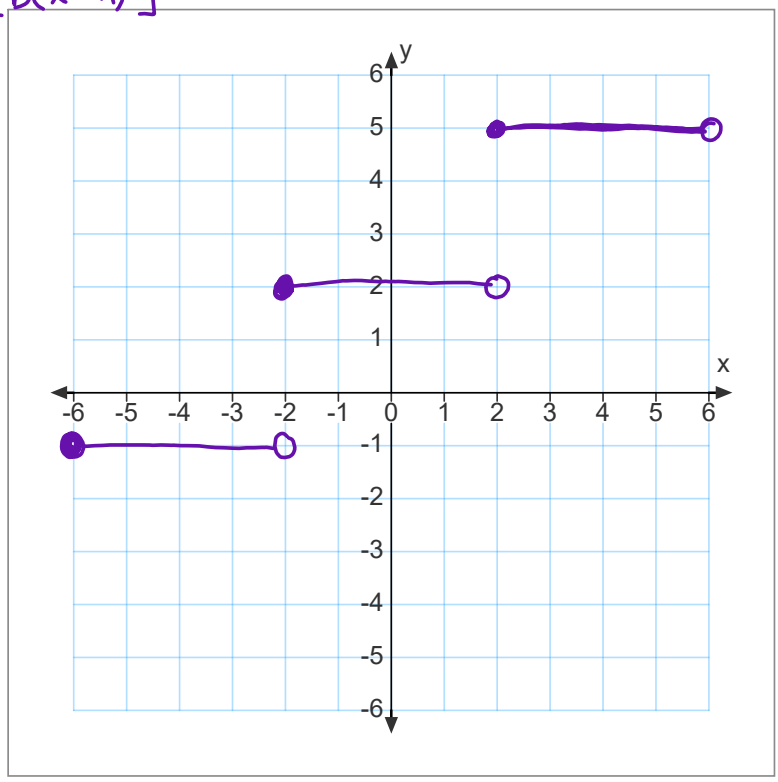
$a[b(x-h)]+k$

$a=3$ countersloop $=3$

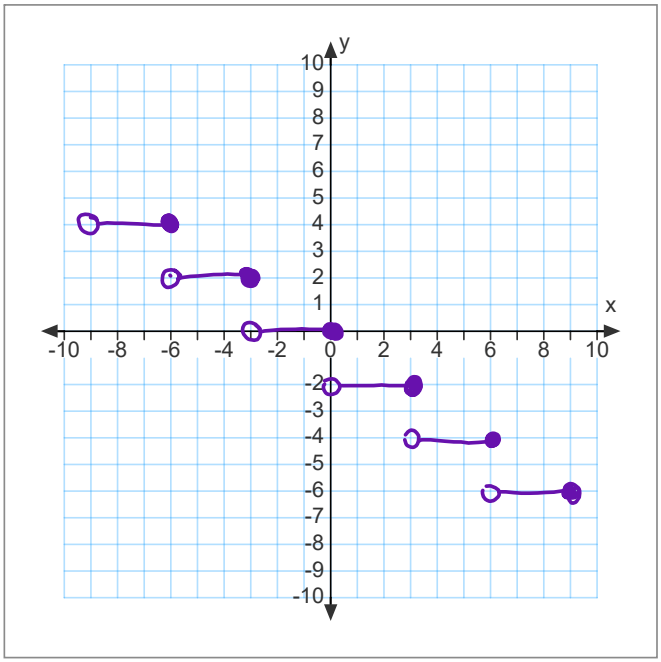
$b=\frac{1}{4}$ step length $=4$

a^+, b^+ inc

$h=2$, $k=5$ } start at $(2,5)$



$$f(x)=2\left[-\frac{(x+6)}{3}\right]+4$$



$a = 2$ $b = -\frac{1}{3}$

Countersteps: 2 step length = 3

a^+, b^- } decreasing,

$h = -6$ $k = 4$

$(-6, 4)$ start

$$k(x)=\frac{1}{2}[4x-2]+\frac{3}{2}$$

$[b(x-h)]$

$bx-bh$

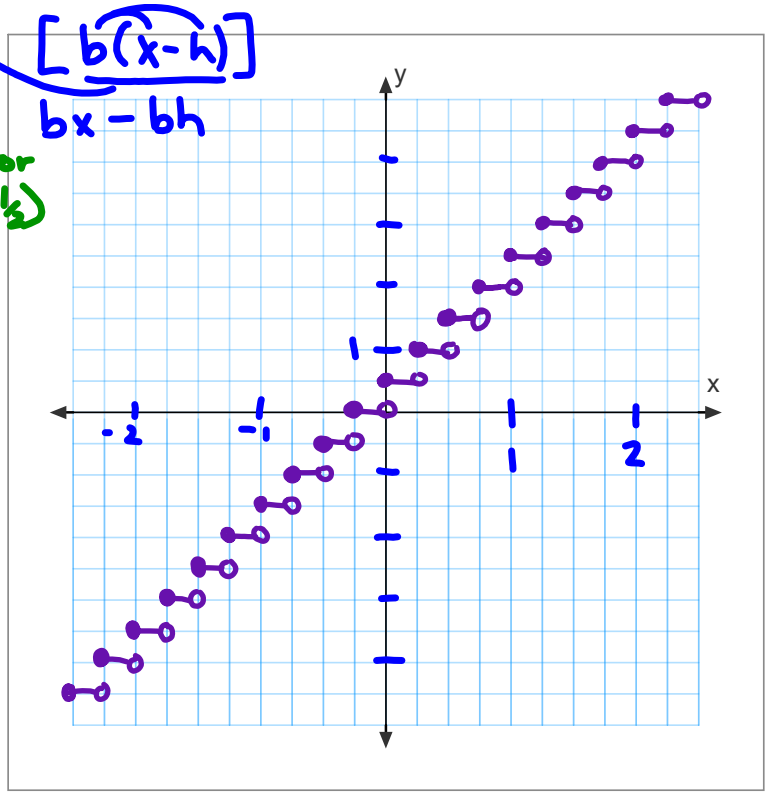
factor $4(x-\frac{1}{2})$

$a=\frac{1}{2}$ c.s = $\frac{1}{2}$

$b=4$ length = $\frac{1}{4}$

a^+, b^+ } inc

$h=\frac{1}{2}$
$k=\frac{3}{2}$ } first point



Given the function $f(x) = -3[1.5 - 0.5x] + 3$, draw its graph and provide a study.

b

a = -3 cs = 3

$f(x) = -3[-0.5(x-3)] + 3$

$b = -\frac{1}{2}$ length = 2

(h,k) = (3,3) a; b⁻

inc

Dom: $\mathbb{R}$

Ran: $\{\ldots, -9, -6, -3, 0, 3, 6, 9, \ldots\}$

Inc: $\mathbb{R}$

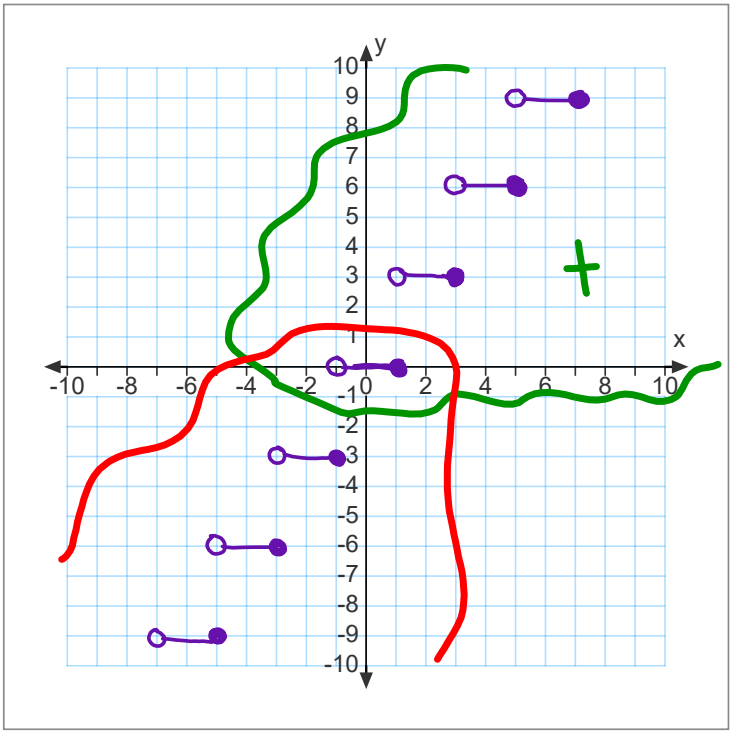
~~Dec:~~

Pos: $]-1, +\infty[$

Neg: $]-\infty, 1]$

y-int: 0

Zeros: $]-1, 1]$



* For a transformed GIF $\left(f(x)=a\left[b(x-h)\right]+k\right)$, the range can be written as

$$\text{Ran}=\{y\,|\,y=am+k, m\in\mathbb{Z}\}$$ set-builder notation

i.e. The range is the set of all y values, such that $y=am+k$, where m is an integer.

$a=-3$ $k=3$

So... $\text{Ran}=\{y\,|\,y=-3m+3, m\in\mathbb{Z}\}$

$m=5$ $y=-12$

$m=1$ $y=0$

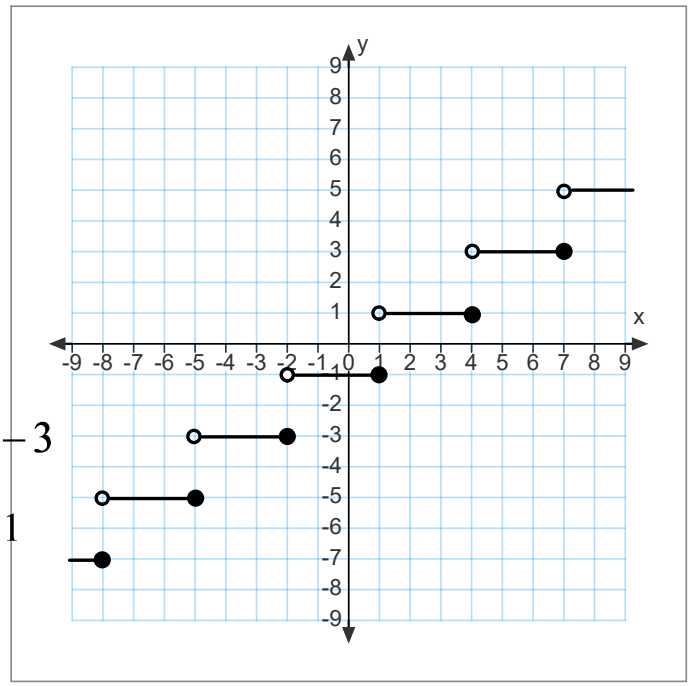
Rachel, Bernard, Christian & Julie cannot agree on the equation of the function f that is represented by the graph. They obtained these equations:

Rachel: $f(x)=2\left[3(x-1)\right]+1$

Bernard: $f(x)=-2\left[-3(x+2)\right]-3$

Christian: $f(x)=-2\left[-\frac{1}{3}(x-4)\right]+1$

Julie: $f(x)=-2\left[-\frac{1}{3}(x+2)\right]-3$



Which of the four friends is/are right?