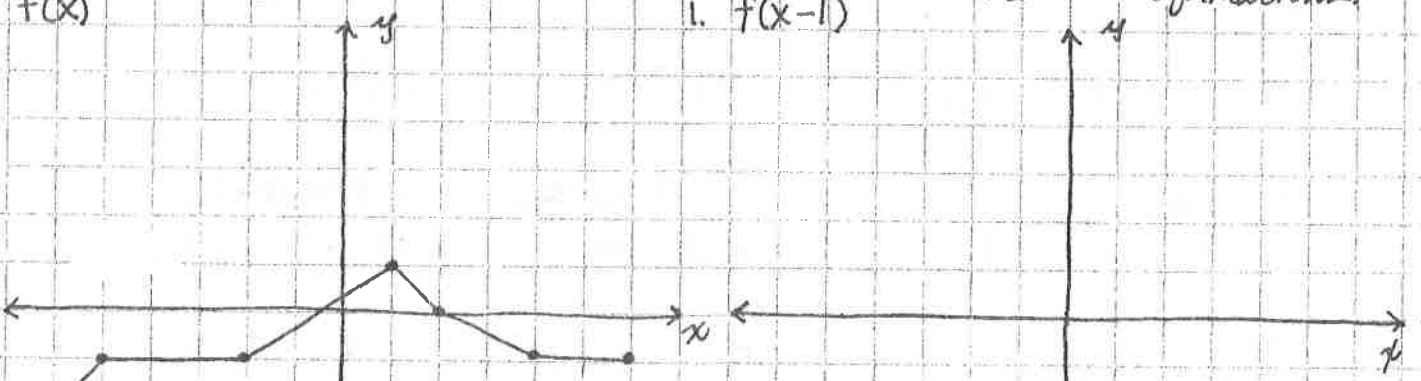


Draw the new function and label 3 points. Provide name of all transformations.

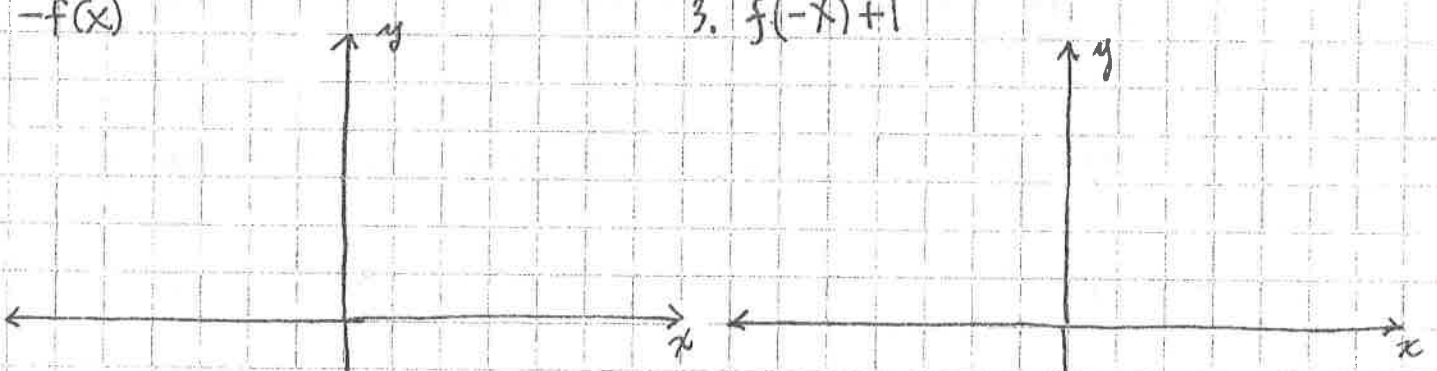
$f(x)$

1. $f(x-1)$



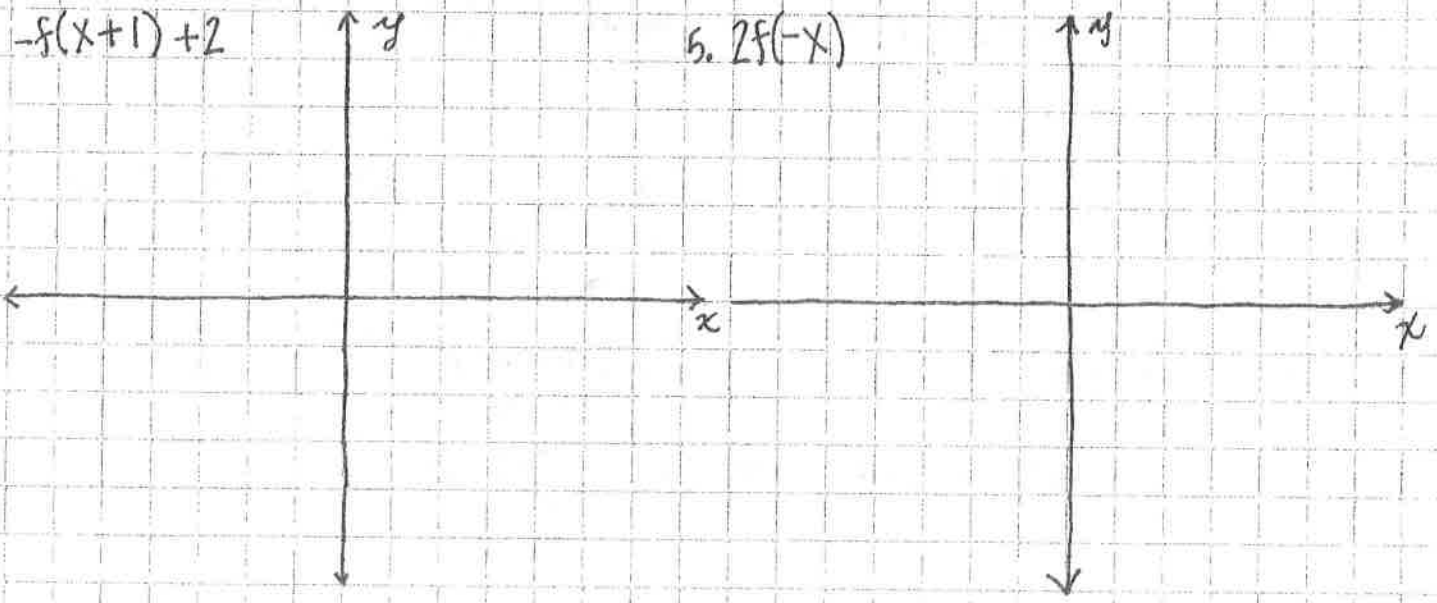
2. $-f(x)$

3. $f(-x)+1$



4. $-f(x+1)+2$

5. $2f(-x)$



Fill in blanks. Transformation Rules for Functions

Equation

How to obtain the graph

$y = f(x) + c$ ($c > 0$)

Shift graph $y = f(x)$ up c units

Shift graph $y = f(x)$ down c units

$y = f(x - c)$ ($c > 0$)

Shift graph $y = f(x)$ _____

_____ ($c > 0$)

Shift graph $y = f(x)$ left c units

_____ ($c > 0$)

Reflect graph $y = f(x)$ over x-axis

$y = f(-x)$ ($c > 0$)

_____ graph $y = f(x)$ _____

$y = af(x)$ ($a > 1$)

Stretch graph $y = f(x)$ _____ by factor of a

$y = af(x)$ ($0 < a < 1$)

_____ graph $y = f(x)$ vertically by factor of a

(Multiply y-coordinates of $y = f(x)$ by a)

_____ ($c > 1$)

Shrink graph $y = f(x)$ horizontally by factor of c

$y = f(cx)$ _____

_____ graph $y = f(x)$ _____ by factor of c

(Divide x-coordinates of $y = f(x)$ by c .)