# Graphing Functions (1.4)
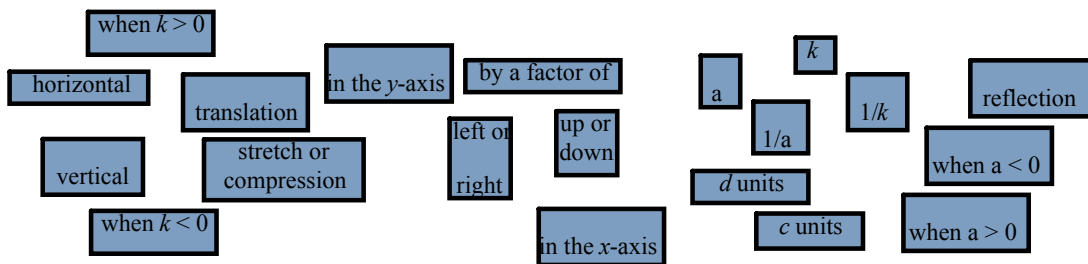
## Math Learning Target:

"When I am given the equation of a transformed parent function,
I can describe all transformations in order,
determine a mapping formula, and graph the function.
When transformations are described, I can find its equation and graph.
I can state all properties about a transformed parent function."

The function $y = f(x)$ can be transformed into $y = af[k(x-d)]+c$
*Use as many terms and values below to describe all of the possible transformations.*
*Some may not be used.*

$$y = af[k(x-d)]+c$$

| when $k > 0$ |
| horizontal | in the $y$-axis | by a factor of | $k$ |
| translation | | | $a$ | $1/k$ | reflection |
| | left or | up or | | | |
| stretch or | right | down | $1/a$ | when $a < 0$ |
| vertical | compression | | $d$ units | |
| when $k < 0$ | | in the $x$-axis | $c$ units | when $a > 0$ |

**Ex. 1**  State the function that would result from horizontally
compressing $y = f(x)$ by a factor of 1/4,
and then translating it 3 units left.

**Ex. 2**  For the function $y = 2 \cdot 3^x + 1$, state the:
a) parent function
b) domain and range
c) intervals of increase/decrease
d) end behaviours

**Ex. 3** Describe, in order of application, the transformations of $f(x) = \sqrt{x}$ defined by $y = -f[3x + 3]$.
Graph the transformed function, and state the equation.
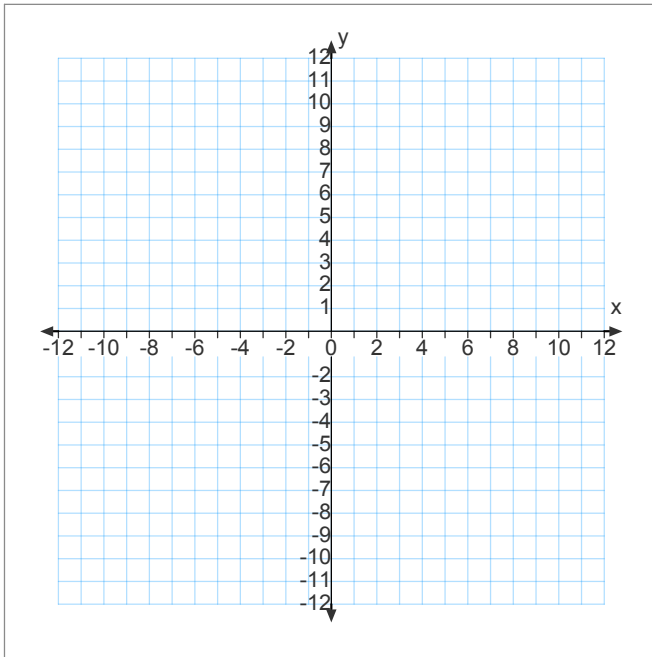


**Ex. 4** The point (-1, 5) belongs to the function $y = f(x)$.
Determine its corresponding coordinates
for the function $y = f(-x - 4) + \frac{3}{2}$.

**Graphically**
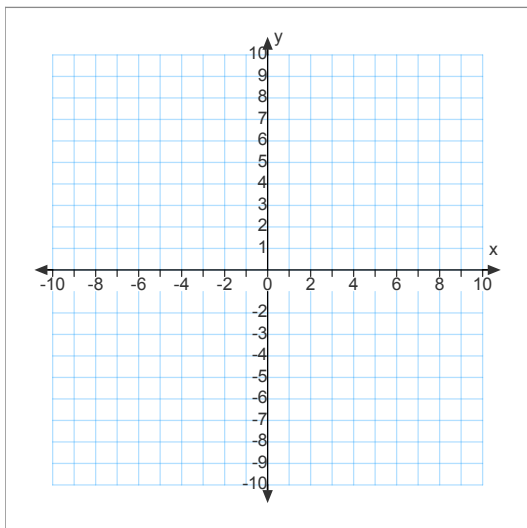
**Numerically**



**Algebraically**
(mapping formula)

Do all questions on the worksheet