TransformationsofFunctions

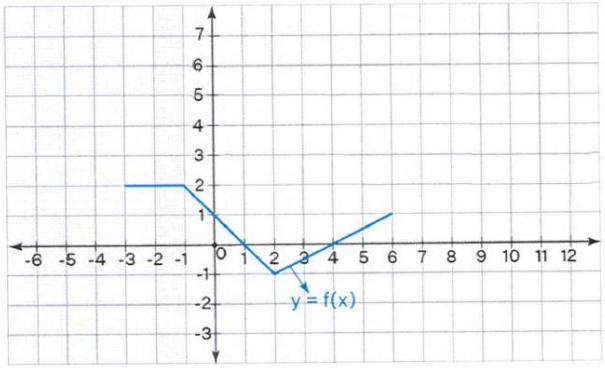
https://www.cuemath.com/calculus/transformation-of-functions/

Making **graphing transformations** easier: transform the function $y = f(x)$ to $y = af(b(x + c)) + d$.

- **Step1:** Note down some coordinates on the original curve that define its shape, i.e., we now know the old x and y coordinates.
- **Step2:** To find the new x −coordinate of each point just set "$b(x + c)$ =oldx-coordinate" and solve this for x.
- **Step3:** To find the new y −coordinate of each point, apply all outside operations (of brackets) on the old y −coordinate. i.e., find $ay + d$ to find each new y-coordinate where 'y' is the old y −coordinate.

Q1: The following graph represents $f(x)$.Graph the function transformation

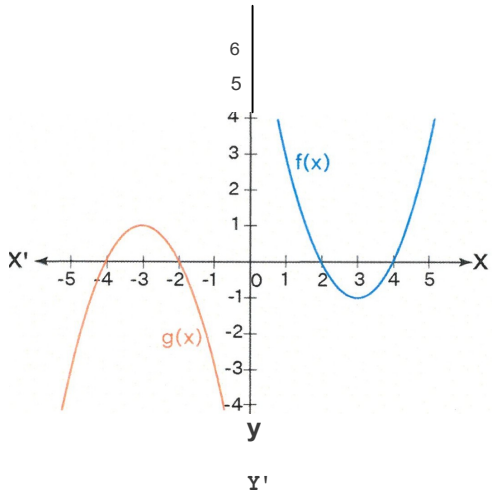
$$y = 2f(\frac{x}{2}) + 3$$



Q 2: Describe the transformations of quadratic function $g(x) = x^2 + 4x + 5$ by comparing it to its parent function $f(x) = x^2$.

Q3: State the combination of transformations applied on the function $f(x)$ to obtain $g(x)$: $f(x) = -3x - 6$ and $g(x) = x + 2$.

Q4: Write the function corresponding to the graph of $g(x)$ that transformed from the graph f(x) by using the function transformation rules.



Q5: Match the following function transformations.

$f\ (4x)$	:: Horizontal translation by 4 units left
$4f\ (x)$	:: Horizontal dilation by a scale factor of 1/4
$f\ (x + 4)$	:: Vertical translation by 4 units up
$f\ (x) + 4$	:: Vertical dilation by a scale factor of 4