

Warm-up!

Let $f(x) = \sqrt{x}$

Compared to $f(x)$, do you know what the graph of $g(x) = 3\sqrt{x}$ looks like?

Compared to $f(x)$, do you know what the graph of $g(x) = \sqrt{x+5}$ looks like?

Compared to $f(x)$, do you know what the graph of $g(x) = -\sqrt{x} + 6$ looks like?

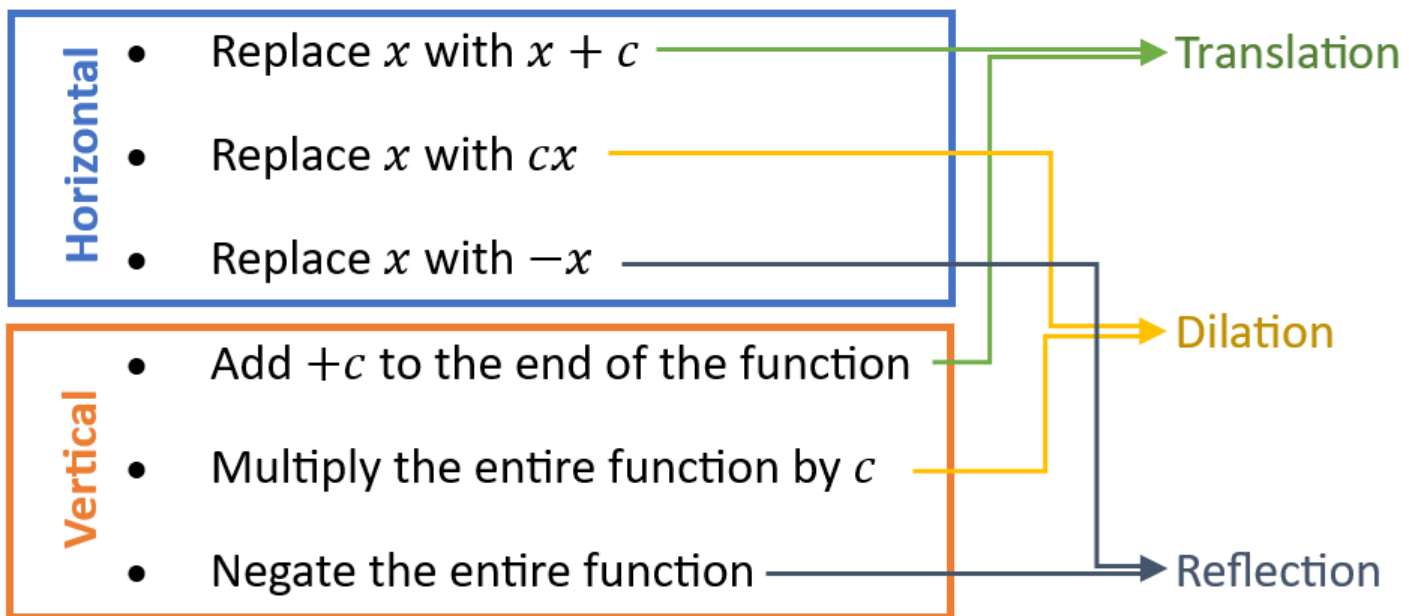
Periodic Graphs Day 1

- (1.12) Transformations Review

Homework: Transformations Refresh

Transformations

There are six basic transformations:



Example 1: Translations

Let $g(x) = f(x + 3) + 5$

If the point $(2,10)$ is on the graph of $f(x)$,
determine the corresponding point on the graph of
 $g(x)$.

Example 2: Dilations

Let $g(x) = 3f(2x)$

If the point $(-10, 12)$ is on the graph of $f(x)$,
determine the corresponding point on the graph of
 $g(x)$.

Example 3: Translation + Dilation

$$\text{Let } g(x) = f\left(\frac{1}{3}x\right) + 6$$

Describe the transformations, in order, that map the graph of $f(x)$ to the graph of $g(x)$.

If the point $(3, -1)$ is on the graph of $f(x)$, find the corresponding point on the graph of $g(x)$.

Example 4

To the function $f(x)$, perform the following transformations in this order: a horizontal dilation by a factor of 3, a vertical dilation by a factor of 2, a horizontal translation by 5 units.

Starting: $f(x)$

After horizontal dilation by a factor of 3:

After vertical dilation by a factor of 2:

After horizontal translation by 5 units:

If the point $(12,6)$ is on the graph of $f(x)$, find the corresponding point on the transformed graph.

Example 5

To the function $f(x)$, perform the following transformations in this order: a vertical translation by -2 units, A horizontal dilation by a factor of $\frac{1}{4}$, a vertical dilation by a factor of 3.

Starting: $f(x)$

After vertical translation by -2 units:

After horizontal dilation by a factor of $\frac{1}{4}$:

After vertical dilation by a factor of 3:

If $f(x)$, has domain $[-20, 8]$ and range $[-5, 10]$, find the domain and range of the transformed function.

Example 6: Reflections

The graph of $g(x)$ is the image of the graph of $f(x)$ after the following transformations in the following order: Horizontal dilation by a factor of $\frac{1}{3}$, reflection over the x -axis, horizontal translation -2 units

A) Find an equation for $g(x)$ in terms of $f(x)$.

B) If the point $(6,10)$ is on the graph of $f(x)$, find the corresponding point on the graph of $g(x)$.

Example 7

Let $g(x) = f(-x + 4) - 3$

A) Describe the transformations, in order, that map the graph of $f(x)$ to the graph of $g(x)$.

B) If the point $(2,5)$ is on the graph of $f(x)$, find the corresponding point on the graph of $g(x)$.

Example 8

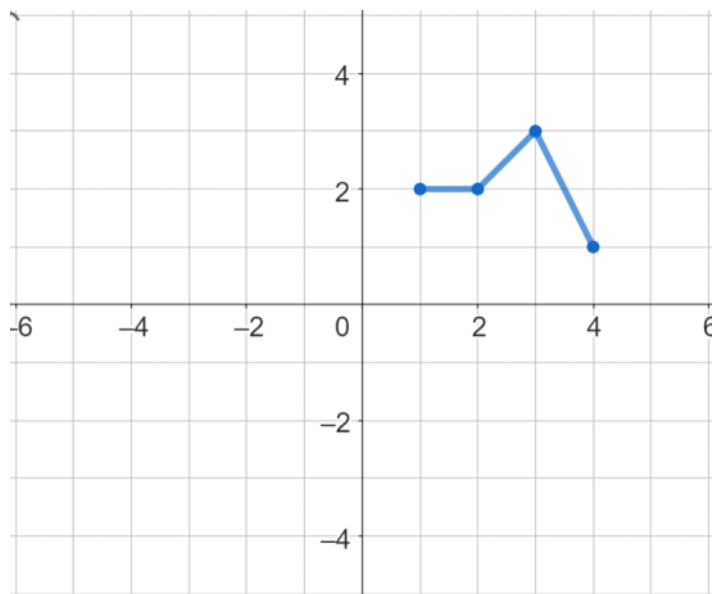
The function f is given by $f(x) = x^2 + 3x$

Find the equation of the function whose graph is the image of the graph of $f(x)$ after the following a reflection over the y -axis followed by a horizontal translation by 2 units.

Example 9

The graph of $y = f(x)$ is shown to the right.

Sketch $g(x) = f(-(x - 2)) + 1$



Example 10

To the function $f(x)$, perform the following transformations in this order: a horizontal dilation by a factor of $\frac{1}{2}$, a vertical translation by -3 units, a reflection over the x -axis.

Starting: $f(x)$

After horizontal dilation by a factor of $\frac{1}{2}$:

After vertical translation by -3 units:

After a reflection over the x -axis:

If the domain of $f(x)$ is $[-4,10]$ and the range of $f(x)$ is $[-5,5]$, find the domain and range of the transformed function.

Example 11

$g(x)$ is the result of applying the following transformations, in order, to $f(x)$: Horizontal dilation by a factor of $\frac{1}{2}$, horizontal translation by -3 units, vertical dilation by a factor of 10.

A) Find an expression for $g(x)$ in terms of $f(x)$

B) The following are values of $f(x)$. Find $g(2)$

x	2	4	6	8	10	12	14	16
$f(x)$	5	6	-1	7	-4	3	0	-2