

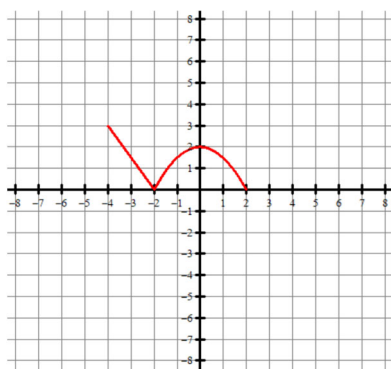
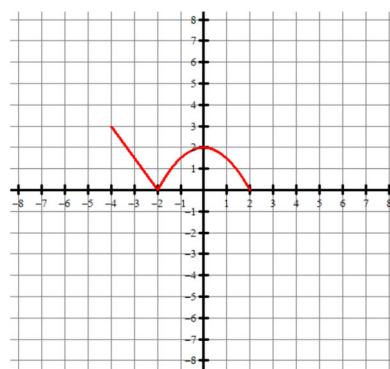
Write your questions
and thoughts here!

Multiplicative Transformations

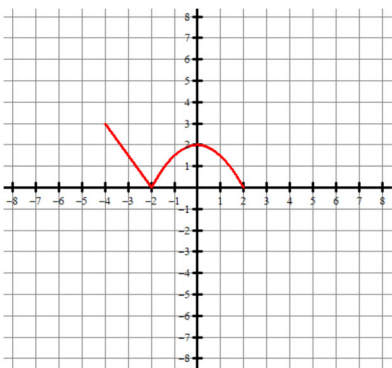
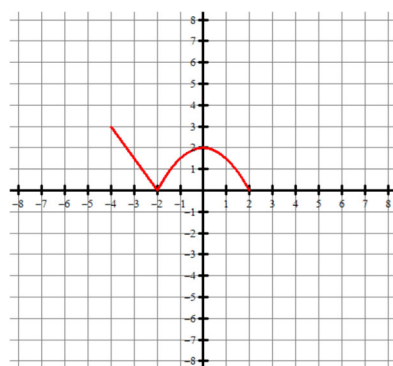
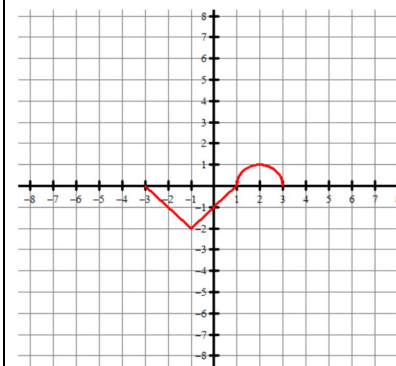
Dilations =

Graphically

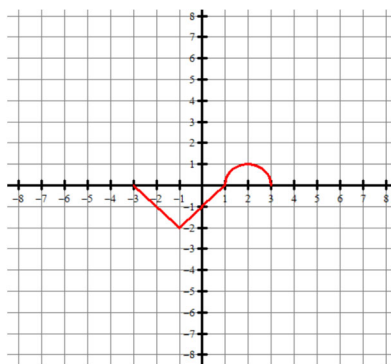
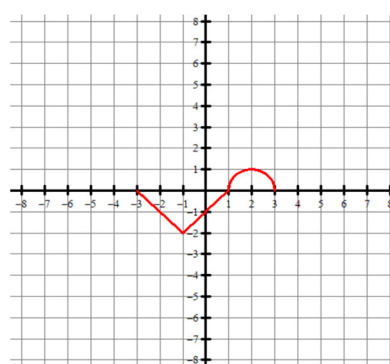
Example #1 Vertical Dilations

Given the graph f .Let $g(x) = 2f(x)$, graph $g(x)$ Given the graph f .Let $g(x) = \frac{1}{2}f(x)$, graph $g(x)$ 

Example #2 Horizontal Dilations

Given the graph f .Let $g(x) = f(2x)$, graph $g(x)$.Given the graph f .Let $g(x) = f\left(\frac{1}{2}x\right)$, graph $g(x)$.Given the graph f .Let $g(x) = f(-x)$, graph $g(x)$.

Example #3

Given the graph f .Let $g(x) = 3f(x) + 2$, graph $g(x)$.Given the graph f .Let $g(x) = -f(2(x+3)) + 1$, graph $g(x)$.

Write your questions
and thoughts here!



Algebraically

Example 4:

Given $f(x) = x^2 - 3x + 2$

Let $g(x) = 2f(x) + 4$, find $g(x)$.

Given $f(x) = 6x + 3$

Let $g(x) = \frac{1}{3}f(x + 2)$, find $g(x)$.

Numerically

Example #5

Given the table of values for f .

x	$f(x)$
-2	21
-1	12
0	18
1	14
2	10

Let $g(x) = 5f(x) - 1$, find $g(-1)$.

Given the table of values for f .

x	$f(x)$
0	-20
1	-12
2	0
3	8
4	14

Let $g(x) = f(3(x - 1)) + 2$, find $g(2)$.

Domain and Range

Example #6

Given the graph for f has a domain of $[-2, 5]$ and range of $(4, 9)$. Let $g(x) = 3f(x) + 2$.

Find the domain and range of $g(x)$.

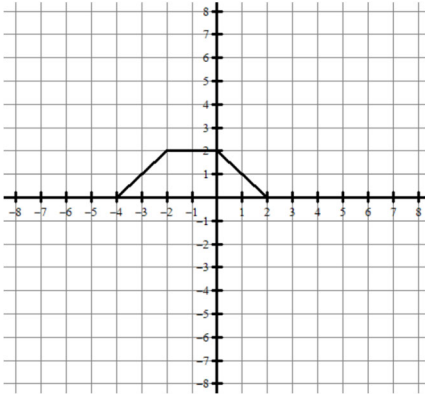
1.12B Dilations of Functions

AP Precalculus

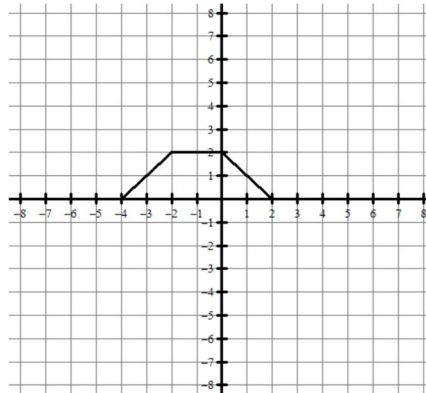
1.12B Practice

GRAPHICAL TRANSFORMATION. Use the graph of f to graph $g(x)$.

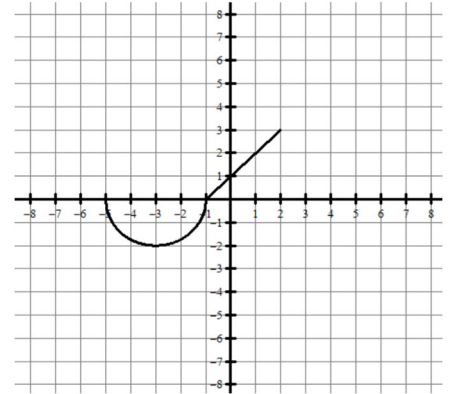
1. $g(x) = 3f(x) - 5$



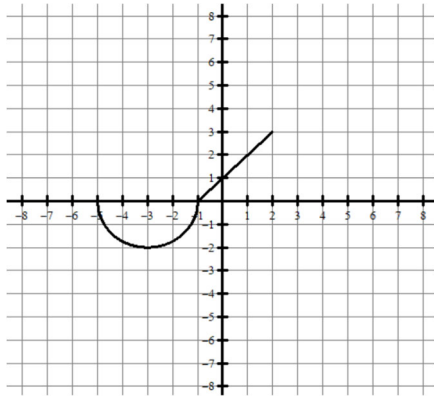
2. $g(x) = f\left(\frac{1}{2}x\right)$



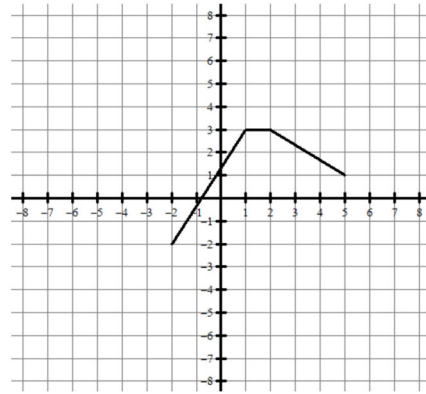
3. $g(x) = -f(x - 2)$



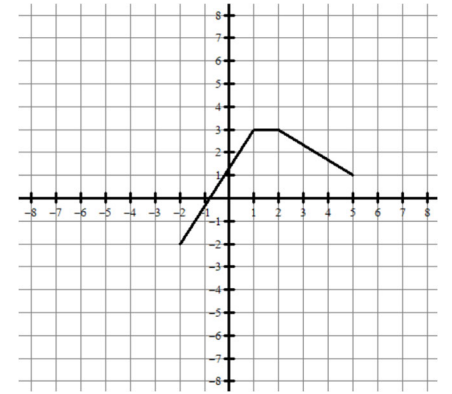
4. $g(x) = \frac{1}{2}f(x)$



5. $g(x) = f(-x) - 4$



6. $g(x) = f(2(x + 1))$



ALGEBRAIC TRANSFORMATION. Express the $g(x)$ in terms of x .

7. $f(x) = 4x + 3$

$g(x) = 3f(x) + 5$, find $g(x)$.

8. $f(x) = 2x + 6$

$g(x) = f\left(\frac{1}{2}(x + 2)\right) - 1$, find $g(x)$.

9. $f(x) = 4x - 5$

$g(x) = -2f(x + 1) + 5$, find $g(x)$.

10. $f(x) = 2x^2 - 3x + 1$

$g(x) = f(2x) + 3$, find $g(x)$.

NUMERIC TRANSFORMATION. Use the table of values to answer the following.11. Given the table of values for f .

x	$f(x)$
-9	2
-3	8
2	15
6	-2
8	-13

Let $g(x) = f(3x) + 1$, find $g(2)$.12. Given the table of values for f .

x	$f(x)$
0	0
1	2
2	4
3	8
4	16

Let $g(x) = 2f(x + 2) - 3$, find $g(1)$.13. Given the table of values for f .

x	$f(x)$
-8	-32
-2	6
0	-8
2	21
8	14

Let $g(x) = 4f(-x)$, find $g(2)$.**DOMAIN AND RANGE TRANSFORMATION. Find the domain and range of the transformed function.**

14.

Given the graph for f has a domain of $(-6, 8]$ and range of $[-4, 8]$.

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

Find the domain and range of $g(x)$.

15.

Given the graph for f has a domain of $(0, 5)$ and range of $[-10, 4]$.

Let $g(x) = 2f(x - 3) + 4$.

Find the domain and range of $g(x)$.

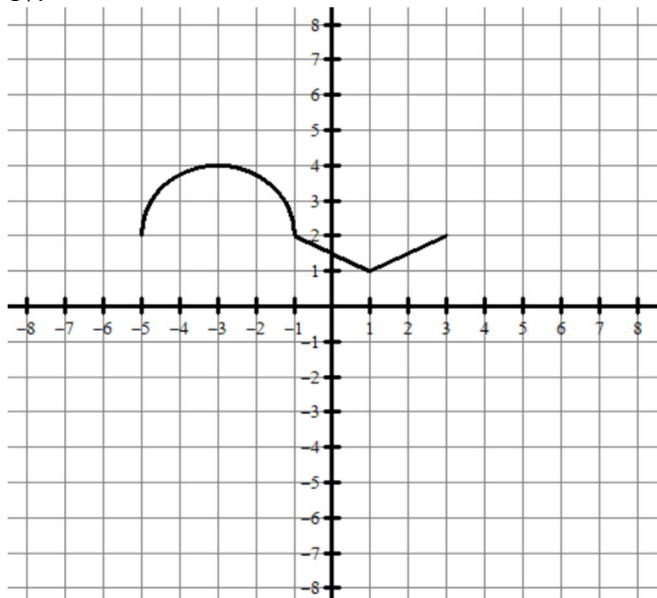
16.

Given the graph for f has a domain of $[-2, 4]$ and range of $(-6, 8)$.

Let $g(x) = f\left(\frac{1}{2}x\right) + 5$.

Find the domain and range of $g(x)$.**Use the graph f to answer the following.**

17.

Let the $g(x) = 2f(x - 3) - 1$

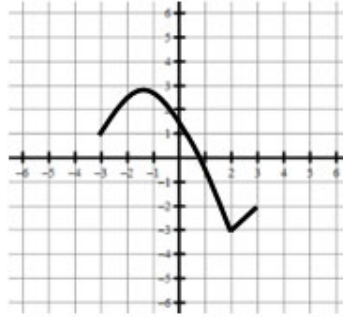
- Graph the $g(x)$.
- State the domain of $g(x)$.
- State the range of $g(x)$.
- Find $g(-2)$.
- Find the zeroes of $g(x)$.
- Find the y -intercept of $g(x)$.

1.12B Dilations of Functions

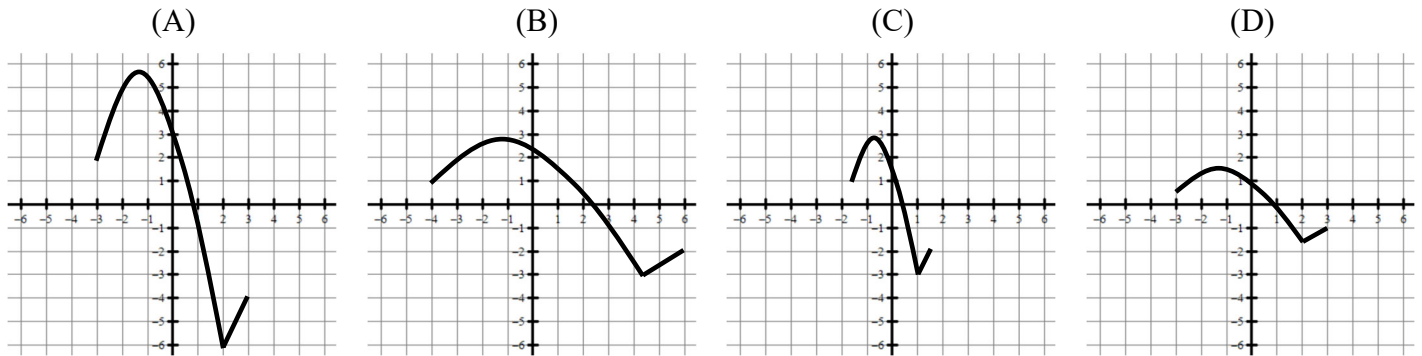
1.12B Test Prep

Multiple Choice

18. The graph of $y = f(x)$ is shown for $-3 \leq x \leq 4$.



Which of the following is the transformed graph for $y = f(2x)$?



19. The table gives values for a polynomial function f at selected values of x .

x	-2	0	2	4	8	16
$f(x)$	38	12	-24	-32	-12	-48

In the xy -plane, the graph of g is constructed by applying three transformations to the graph of f in this order: a horizontal dilation of $\frac{1}{2}$, a vertical dilation of 4 and vertical translation by 6 units. What is the value of $g(4)$?

- (A) 3
- (B) -42
- (C) -90
- (D) 0
-
20. The function g is defined by f such that $g(x) = 3f(2x) - b$. If $f(2) = a$, $f(4) = 8$, $g(1) = 7$ and $g(2) = 19$ what is the value of a ?
- (A) 6
- (B) 4
- (C) 2
- (D) -2