

## TRANSFORMATIONS

Use the numerical representation of  $f(x)$  below to match the numerical information in column A with the symbolic representation in column B.

$x$	-4	-2	0	2	4
$f(x)$	5	1	6	2	7

Column A

Column B

1.

$x$	-4	-2	0	2	4
$g(x)$	7	3	8	4	9

2.

$x$	-2	-1	0	1	2
$h(x)$	5	1	6	2	7

3.

$x$	-2	0	2	4	6
$m(x)$	5	1	6	2	7

4.

$x$	-8	-4	0	4	8
$n(x)$	5	1	6	2	7

5.

$x$	-4	-2	0	2	4
$l(x)$	-5	-1	-6	-2	-7

6.

$x$	4	2	0	-2	-4
$k(x)$	5	1	6	2	7

7.

$x$	7	5	3	1	-1
$u(x)$	11	6	10	5	9

a.  $f(x-2)$

shift right 2 units  
(add 2 to x-values)

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

horizontal stretch  
by factor of 2  
(multiply x-values by 2)

c.  $f(x)+2$

shift up 2 units  
(add 2 to y-values)

d.  $f(-x)$

reflect across y-axis  
(x-values change signs)

e.  $f(x-3)+4$

• shift right 3 units  
(add 3 to x-values)  
• shift up 4 units  
(add 4 to y-values)

f.  $-f(x)$

reflect across x-axis  
(y-values change signs)

g.  $f(x+2)$

shift left 2 units  
(subtract 2 from x-values)

h.  $f(2x)$

horizontal shrink  
by factor of  $\frac{1}{2}$   
(multiply x-values by  $\frac{1}{2}$ )

Use the numerical representation of  $f(x)$  below write the numerical information that corresponds to the given symbolic representation.

$x$	-3	-2	-1	0	1
$f(x)$	-6	0	3	-2	5

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

shift left 1 unit  
(x-values move left 1 unit)

$x$	-4	-3	-2	-1	0
$g(x)$	-6	0	3	-2	5

2.  $h(x) = 3f(x)$

vertical stretch by factor of 3  
(multiply y-values by 3)

$x$	-3	-2	-1	0	1
$h(x)$	-18	0	9	-6	15

3.  $k(x) = f(3x)$

horizontal shrink by factor of 3  
(multiply x-values by  $\frac{1}{3}$ )

$x$	-1	$-\frac{2}{3}$	$-\frac{1}{3}$	0	$\frac{1}{3}$
$k(x)$	-6	0	3	-2	5

4.  $m(x) = -f(x)$

reflect across x-axis  
(y-values change signs)

$x$	-3	-2	-1	0	1
$m(x)$	6	0	-3	2	-5

5.  $n(x) = f(-x)$

reflect across y-axis  
(x-values change signs)

$x$	-1	0	1	2	3
$n(x)$	5	-2	3	0	-6

6.  $p(x) = f(x + 2) - 3$

shift left 2 units  
(x-values move left)  
shift down 3 units  
(y-values move down)

$x$	-5	-4	-3	-2	-1
$p(x)$	-9	-3	0	-5	2

7.  $u(x) = -f(x + 1) + 2$

reflect across y-axis  
(y-values change signs)  
shift up 2 units  
(add 2 to y-values)  
shift left 1 unit  
(x-values move left 1 unit)

$x$	-4	-3	-2	-1	0
$u(x)$	8	2	-1	4	-3