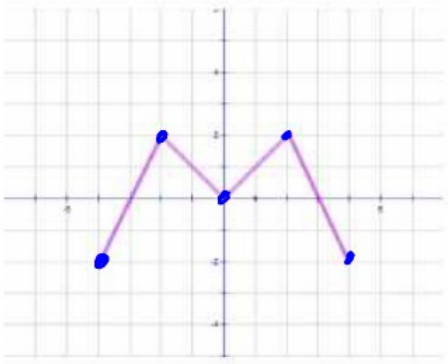
Transforming Arbitrary Functions

Use the following arbitrary function to transform each function as indicated.

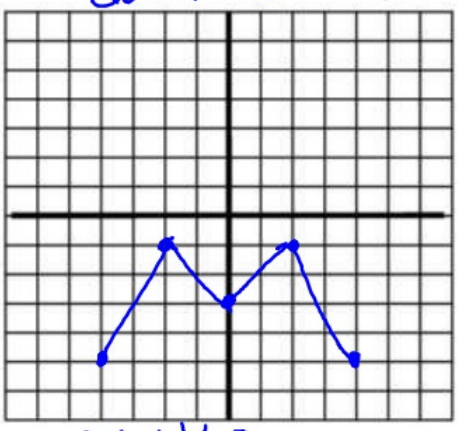


x	Y
-4	-2
-2	2
0	0
2	2
4	-2

State the transformation of each function. Then sketch a graph of the transformed function. Make a table!

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

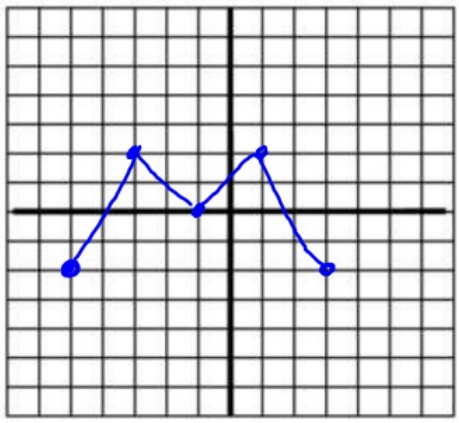
down 3 → Y



X	Y-3
-4	-2-3=-5
-2	2-3=-1
0	0-3=-3
2	2-3=-1
4	-2-3=-5

2) $h(x) = f(x+1)$

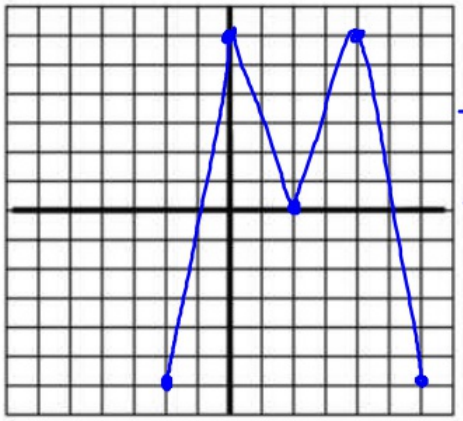
left 1 → X



X-1	Y
-4-1=-5	-2
-2-1=-3	2
0-1=-1	0
2-1=1	2
4-1=3	-2

3) $j(x) = 3f(x-2)$

Right 2 → X
Stretch 3 → 3

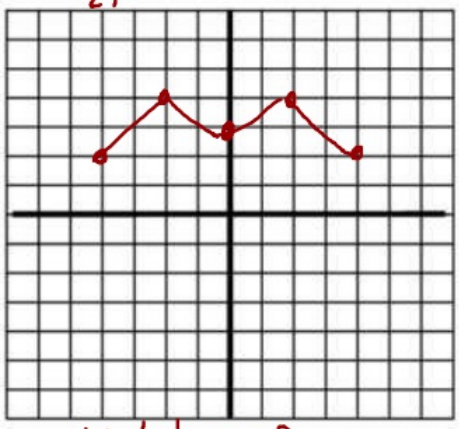


X+2	3Y
-4+2=-2	3(-2)=-6
-2+2=0	3(2)=6
0+2=2	3(0)=0
2+2=4	3(2)=6
4+2=6	3(-2)=-6

4) $k(x) = \frac{1}{2}f(x) + 3$

$= \frac{1}{2}y + 3$

up 3 → Y
Compress ½ → Y



X	$\frac{1}{2}y + 3$
-4	$\frac{1}{2}(-2)+3 = -1+3 = 2$
-2	$\frac{1}{2}(2)+3 = 1+3 = 4$
0	$\frac{1}{2}(0)+3 = 0+3 = 3$
2	$\frac{1}{2}(2)+3 = 4$
4	$\frac{1}{2}(-2)+3 = 2$

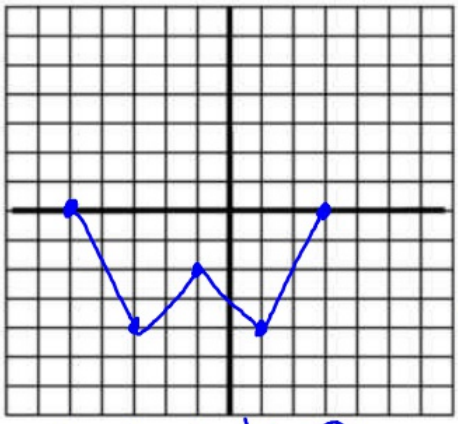
5) $m(x) = -f(x-3)$

Reflect over X → Y
Right 3 → X

X+3	-Y (opposite)
-4+3=-1	2
-2+3=1	-2
0+3=3	0
2+3=5	-2
4+3=7	2

6) $n(x) = -f(x+1) - 2$

Reflect over X → Y
left 1 → X
down 2 → Y



X-1	-Y-2
-5	-(-2)-2 = 2-2 = 0
-3	-(2)-2 = -2-2 = -4
-1	-2
1	-4
3	0