

## Transformations of Functions

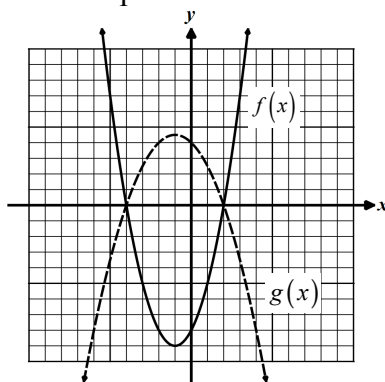
1. Given the point  $(4, 6)$  on the graph of  $y = f(x)$ , state the coordinates of a point which must lie on the graph of each transformation:
- |                       |                                  |  |
|-----------------------|----------------------------------|--|
| (a) $-f(x)$           | (e) $f\left(\frac{1}{2}x\right)$ | (i) $-f\left(\frac{1}{3}x\right) - 5$  |
| (b) $2f(x+3)$         | (f) $f(-x) + 5$                  | (j) $5f(4x) + 8$                       |
| (c) $f(2x)$           | (g) $-3f(x-4) + 2$               | (k) $-f\left(-\frac{1}{2}x\right) + 3$ |
| (d) $\frac{1}{2}f(x)$ | (h) $-\frac{1}{4}f(2x)$          | (l)* $f(2x-4)$                         |
2. (a) The domain of the function  $f(x)$  is  $-4 \leq x \leq 8$  and the range of  $f(x)$  is  $-1 \leq y \leq 5$ . State the domain and range of  $g(x)$  if  $g(x) = -f(x-2) + 5$ .
- (b) The domain of the function  $f(x)$  is  $4 \leq x \leq 9$  and the range of  $f(x)$  is  $-10 \leq y \leq 30$ . State the domain and range of  $g(x)$  if  $g(x) = -f(2x) - 10$ .
3. The function  $f(x)$  is shown below graphed in solid while the function  $g(x)$  is shown dashed. Which of the following equations describes the relationship between the two functions?

(1)  $g(x) = f(x) - 6$

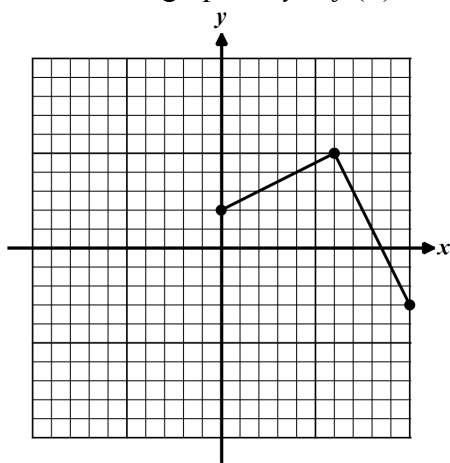
(2)  $g(x) = -\frac{1}{2}f(x)$

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

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

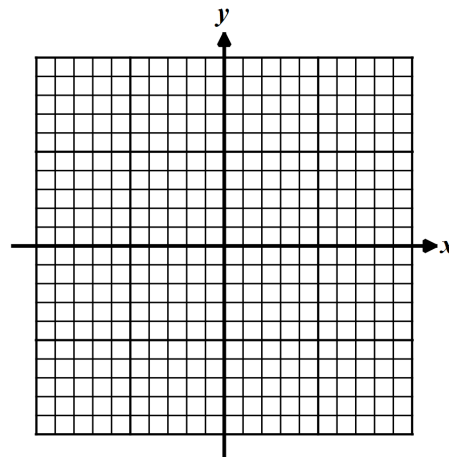
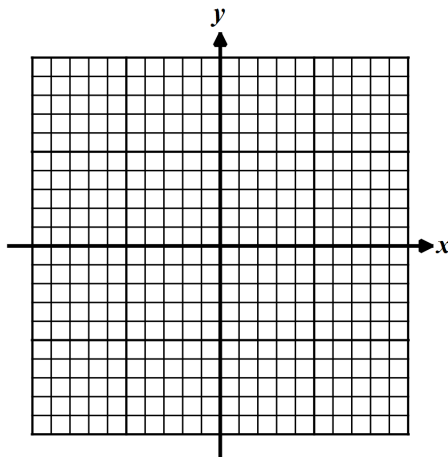


4. Given the graph of  $y = f(x)$  below, sketch the graph of each transformation.

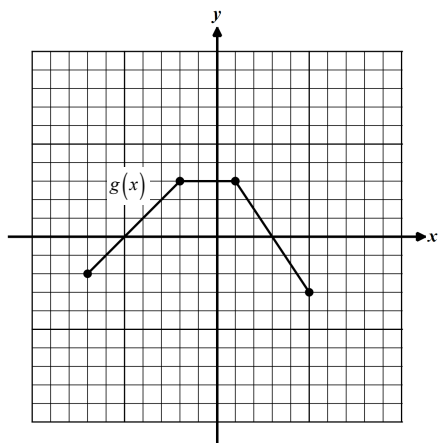


(a)  $y = 2f(x+4)$

(b)  $y = -f(x) + 2$



5. Given the graph of  $y = g(x)$  below, sketch the graph of each transformation.



(a)  $y = g(-x) - 4$

(b)  $y = -g(2x) + 5$

