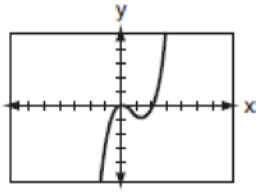
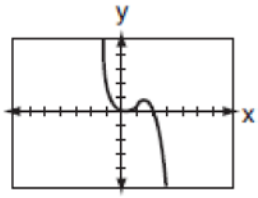
F.BF.B.3: Transformations with Functions 4

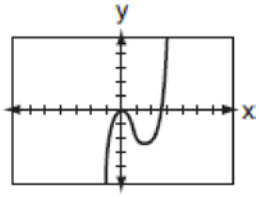
1 Given the parent function $f(x) = x^3$, the function $g(x) = (x-1)^3 - 2$ is the result of a shift of $f(x)$
1) 1 unit left and 2 units down
2) 1 unit left and 2 units up
3) 1 unit right and 2 units down
4) 1 unit right and 2 units up

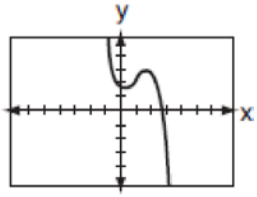
2 The accompanying graph represents the equation $y = f(x)$.

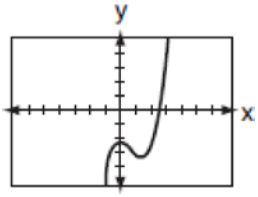


Which graph represents $g(x)$ if $g(x) = -f(x)$?

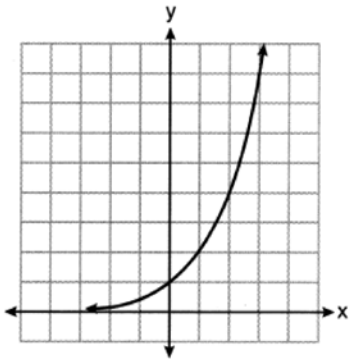
1)


2)


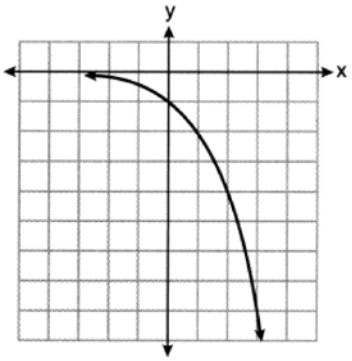
3)


4)


3 Consider the function $y = h(x)$, defined by the graph below.

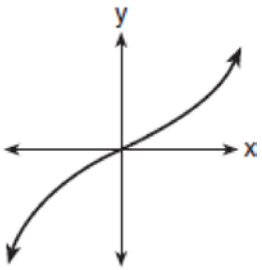


Which equation could be used to represent the graph shown below?

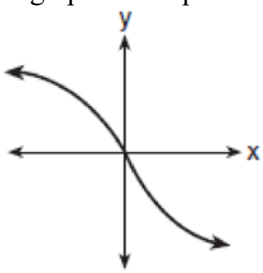


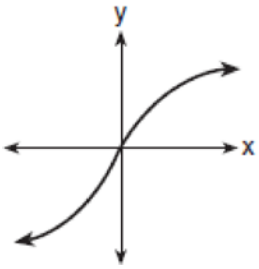
1) $y = h(x) - 2$
2) $y = h(x - 2)$
3) $y = -h(x)$
4) $y = h(-x)$

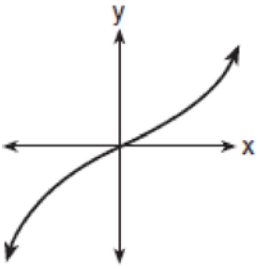
4 The graph below represents f(x).

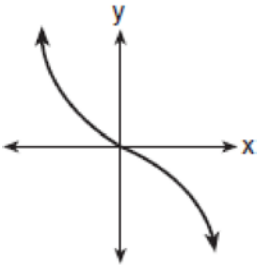


Which graph best represents f($-x$)?

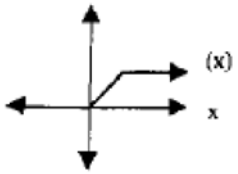
1)


2)


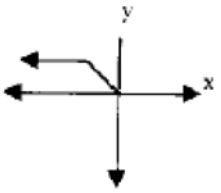
3)


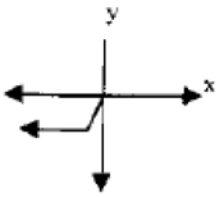
4)


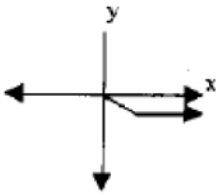
5 The graph below represents f(x).

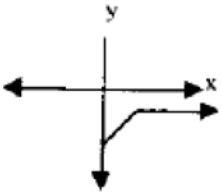


Which of the following is the graph of $-f(x)$?

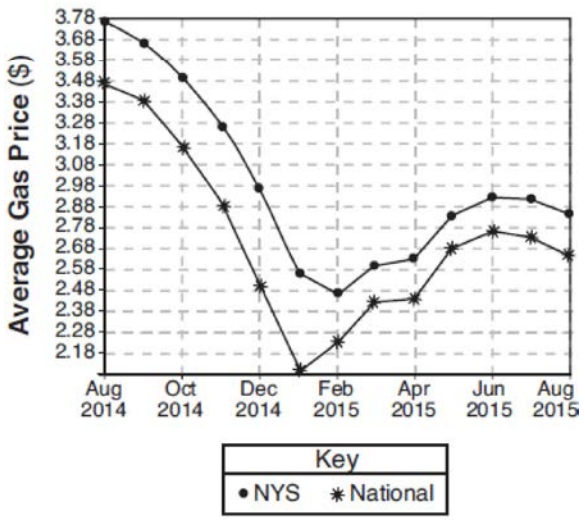
1)


2)


3)


4)


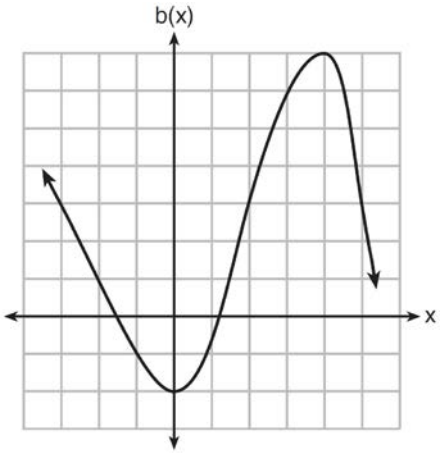
6 The graph below represents national and New York State average gas prices.



If New York State's gas prices are modeled by $G(x)$ and $C > 0$, which expression best approximates the national average x months from August 2014?

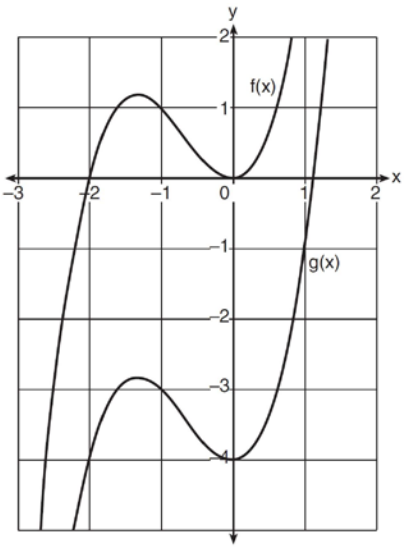
1) $G(x + C)$
2) $G(x) + C$
3) $G(x - C)$
4) $G(x) - C$

7 Richard is asked to transform the graph of $b(x)$ below.



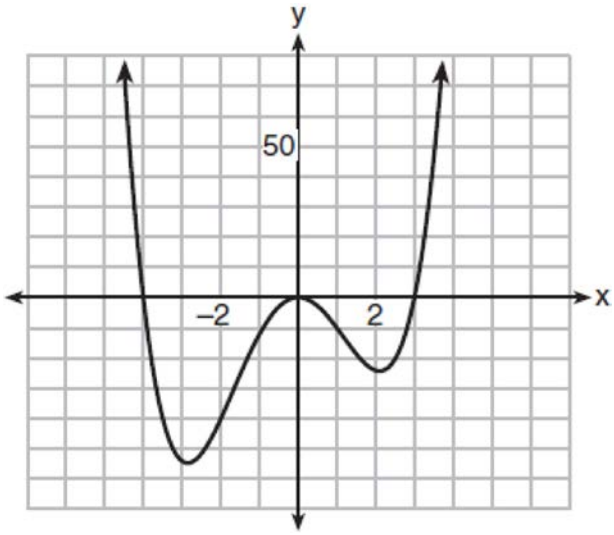
The graph of $b(x)$ is transformed using the equation $h(x) = b(x - 2) - 3$. Describe how the graph of $b(x)$ changed to form the graph of $h(x)$.

8 In the diagram below, $f(x) = x^3 + 2x^2$ is graphed. Also graphed is $g(x)$, the result of a translation of $f(x)$.



Determine an equation of $g(x)$. Explain your reasoning.

9 The graph of $y = f(x)$ is shown below. The function has a leading coefficient of 1.



Write an equation for $f(x)$. The function g is formed by translating function f left 2 units. Write an equation for $g(x)$.

F.BF.B.3: Transformations with Functions 4
Answer Section

1 ANS: 3 REF: 011910ai
2 ANS: 1 REF: 060701b
3 ANS: 3 REF: 062205aii
4 ANS: 4 REF: 080406b
5 ANS: 3 REF: fall9903b
6 ANS: 4 REF: 081817aii
7 ANS:
2 units right and 3 units down.

REF: 081626ai
8 ANS:
$g(x) = x^3 + 2x^2 - 4$, because $g(x)$ is a translation down 4 units.

REF: 061632ai
9 ANS:
$f(x) = x^2(x+4)(x-3);\ g(x) = (x+2)^2(x+6)(x-1)$

REF: 011836aii