

2-3 FUNCTION TRANSFORMATIONS**FLUENCY**

1. Given the function $f(x)$ shown in the table below, which of the following represents the value of $g(4)$ given that $g(x) = 5f(x) + 1$?

(1) 16

(3) 35

(2) 40

(4) 0

x	$f(x)$
2	-8
3	-1
4	3
5	7

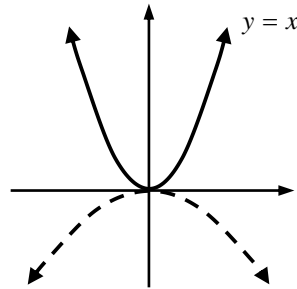
2. The graph of $y = x^2$ is shown below in bold and labeled. Which of the following could be the equation of the graph shown in dashed?

(1) $y = 2x^2$

(3) $y = \frac{1}{3}x^2$

(2) $y = -\frac{1}{2}x^2$

(4) $y = -4x^2$

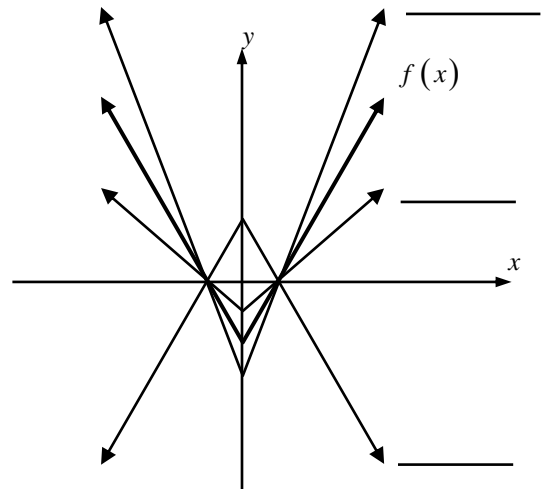


3. The graph of $f(x)$ is shown below in bold. Three other equations of functions are also given. Match each equation with the appropriate graph.

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

$h(x) = \frac{3}{2}f(x)$

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



4. The function $f(x)$ has x -intercepts of -3 and 5 and a y -intercept of 4 . If $g(x) = 3f(x)$, then which of the following will be true about the graph of $g(x)$?

(1) It will have x -intercepts of -9 and 15 and a y -intercept of 12 .

(2) It will have x -intercepts of -3 and 5 and a y -intercept of 12 .

(3) It will have x -intercepts of -9 and 15 and a y -intercept of 4 .

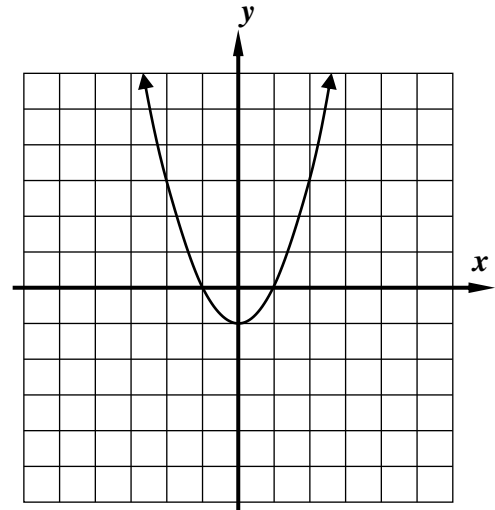
(4) It will have x -intercepts of 0 and 8 and a y -intercept of 7 .

5. The quadratic function $f(x) = x^2 - 1$ is shown graphed on the grid below. Two additional functions are defined as:

$$g(x) = 2f(x) \quad \text{and} \quad h(x) = f(x) + 2$$

- (a) Graph $g(x)$ on the grid and label it. What is the effect of multiplying $f(x)$ by 2?

- (b) Graph $h(x)$ on the grid and label it. What is the effect of adding 2 to $f(x)$?



6. Find equations for the functions $g(x)$ and $h(x)$ in terms of x .

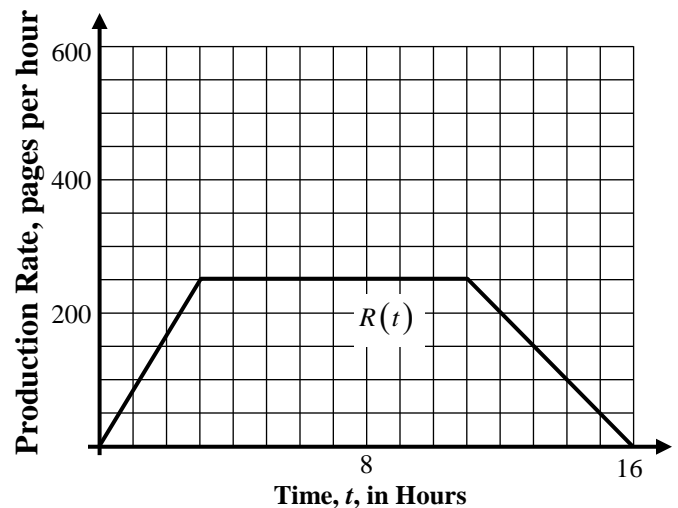
APPLICATIONS

6. A factory operated a printing press that produced pages of text at a rate that rises over the span of a 16 hour schedule, plateaus and then decreases. The rate can be modeled by the function $R(t)$ shown.

If the factory adds another printing press of the same size, it will now have a production rate of:

$$2R(t)$$

Graph the factory's new rate on the same grid.



What is the peak rate of the factory after it adds the second printing press? For how many hours does it maintain this peak rate?

REASONING

7. If both a vertical stretch and a vertical shift occurred to a function in the form of $a \cdot f(x) + k$, which transformation occurred first? How can you tell?