

## APPLYING FUNCTION COMPOSITION

### Inverse Functions

$f(x)$  and  $g(x)$  are inverse functions if and only if  $(f \circ g)(x) = x$  **and**  $(g \circ f)(x) = x$ .

### Verifying Inverses

Determine if each pair of functions are inverses. Write *yes* or *no*.

1)  $f(x) = 3x + 2$

$$g(x) = \frac{1}{3}x - \frac{2}{3}$$

2)  $f(x) = -\frac{1}{8}x^3$

$$g(x) = -2\sqrt[3]{x}$$

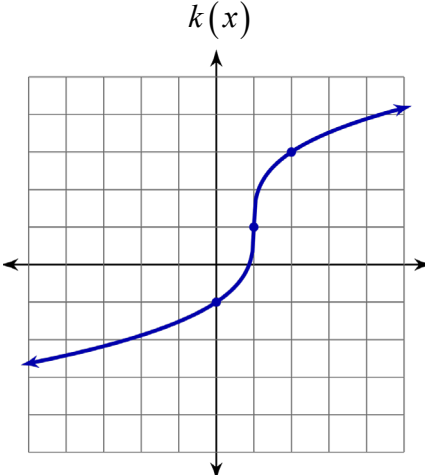
3)  $f(x) = x^2$

$$g(x) = -\sqrt{x}$$

### Extending Your Knowledge

Use the given information below to perform the indicated operations.

#### Given

$h(x) = x^2 - 1$																		
<table border="1" style="margin: auto;"><thead><tr><th><math>x</math></th><th>-1</th><th>0</th><th>1</th><th>2</th><th>3</th></tr></thead><tbody><tr><th><math>f(x)</math></th><td>0</td><td>2</td><td>4</td><td>-3</td><td>-1</td></tr><tr><th><math>g(x)</math></th><td>2</td><td>1</td><td>-3</td><td>0</td><td>5</td></tr></tbody></table>		$x$	-1	0	1	2	3	$f(x)$	0	2	4	-3	-1	$g(x)$	2	1	-3	0
$x$	-1	0	1	2	3													
$f(x)$	0	2	4	-3	-1													
$g(x)$	2	1	-3	0	5													

4)  $(h \circ k)(2) =$

6)  $k(g(2)) =$

5)  $(g \circ f)(0) =$

7)  $f((g \circ h)(-1)) =$