

## Composition & Inverses

In Exercises #1 – 12, suppose  $f(x) = 5 - 2x$ ,  $g(x) = |x - 3|$ , and  $h(x) = x^2 + 2x$ .

1.  $f(g(3))$  \_\_\_\_\_
2.  $g(f(3))$  \_\_\_\_\_
3.  $h(f(5))$  \_\_\_\_\_
4.  $g(h(\sqrt{3}))$  \_\_\_\_\_
5.  $f(g(\pi + 3))$  \_\_\_\_\_
6.  $h(g(2.9))$  \_\_\_\_\_
7.  $g(h(1 - \sqrt{2}))$  \_\_\_\_\_
8.  $f\left(h\left(\frac{1}{2}\right)\right)$  \_\_\_\_\_
9.  $f(g(x))$  \_\_\_\_\_
10.  $g(f(x))$  \_\_\_\_\_
11.  $h(f(x))$  \_\_\_\_\_
12.  $f(h(x))$  \_\_\_\_\_

In Exercise #13 – 19, suppose  $f(x) = 2x + 1$ ,  $g(x) = \frac{1}{2}(x - 1)$ .

13.  $f(g(-4))$  \_\_\_\_\_
14.  $g(f(-4))$  \_\_\_\_\_
15.  $f(g(1.5))$  \_\_\_\_\_
16.  $g(f(1.5))$  \_\_\_\_\_
17.  $f(g(1 + \sqrt{2}))$  \_\_\_\_\_
18.  $g(f(1 - \sqrt{2}))$  \_\_\_\_\_
19. Are  $f$  and  $g$  inverse function? \_\_\_\_\_

20. True or False: If  $f(g(2)) = g(f(2))$ , then  $f$  and  $g$  are inverse. \_\_\_\_\_

21. If  $(-3, 1)$  is in  $f$ , then \_\_\_\_\_ is in  $f^{-1}$ . \_\_\_\_\_

22. If  $-3$  is the  $x$ -intercept of  $f$ , then \_\_\_\_\_ is the  $y$ -intercept of  $f^{-1}$ . \_\_\_\_\_

In Exercise #23-26, find  $f^{-1}(x)$  if  $f$  has an inverse. If the function  $f$  has no inverse, so state.

23.  $f(x) = 1 - x^2$  \_\_\_\_\_

24.  $f(x) = x^3 + 2$  \_\_\_\_\_

25.  $f(x) = \frac{2x - 5}{3}$  \_\_\_\_\_

26.  $f(x) = 2 + |x|$  \_\_\_\_\_

27. Find  $f^{-1}(x)$  if  $f(x) = \frac{1}{x} - 2$  \_\_\_\_\_

28. The function  $g$  is graphed on the set of axes to the right. Sketch the graph of  $g^{-1}$  on the same set of axes.

