

Function Composition

Name: _____

Write the equation of each function using the given transformations.

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

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

$$h(x) = |x|$$

$$j(x) = x^3$$

1) $y = 3g(x)$

2) $y = f(x - 3)$

3) $y = -2j(x)$

4) $y = h\left(\frac{1}{3}x\right)$

5) $y = j(x) + 5$

6) $y = h(-3x) + 1$

7) $y = 2j(x + 2)$

8) $y = -9g(x + 2)$

9) $y = f(x - 2) - 3$

10) $y = 2h(x - 1) + 3$

11) $y = j(-x + 3)$

12) $y = -4g\left(\frac{1}{5}(x + 2)\right) - 10$

Evaluate the following expressions given the functions below. Simplify completely.

$$g(x) = -3x + 1$$

$$f(x) = x^2 - 5$$

$$h(x) = \sqrt{x + 2}$$

$$j(x) = 2x + 9$$

$$k(x) = x^3$$

13) $g(j(x))$

14) $j(g(x))$

15) $f(j(x))$

16) $h(g(x))$

17) $f(h(x))$

18) Challenge: $h(h(x))$

19) Challenge: $k(g(x))$