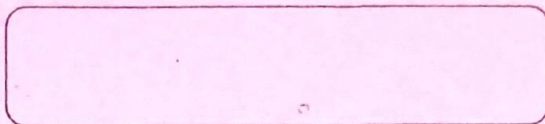


COMPOSITIONS of FUNCTIONS

Another method to combine functions is called a **composition**.
Given $f(x)$ and $g(x)$, the **composite function** $(f \circ g)(x)$ is defined as:



Directions: Given $f(x) = x^3 + 8$, $g(x) = x - 1$, and $h(x) = 5x - 3$, find each function.

11. $(f \circ g)(x)$

12. $(h \circ g)(x)$

13. $(f \circ h)(x)$

14. $(g \circ f)(x)$

Directions: Using the same functions above, find each function value.

15. $(g \circ h)(2)$

16. $(h \circ f)(-6)$

Perform the indicated operation.

1) $g(x) = x - 2$
 $f(x) = x^3 + 3x$
Find $(g \circ f)(x)$

2) $f(x) = x^2 - 3$
 $g(x) = -3x^3 + 4x$
Find $(f \circ g)(x)$

3) $g(x) = 4x^2 + 3$
 $f(x) = x^3 - 3x$
Find $(g \circ f)(x)$

4) $g(x) = x^2 + 3$
 $f(x) = 3x - 2$
Find $(g \circ f)(x)$

5) $g(a) = a^2 + 3$
 $h(a) = 4a - 4$
Find $g(h(a))$

6) $g(x) = 4x + 2$
 $h(x) = x^2 + 1$
Find $g(h(x))$

7) $f(a) = 3a + 3$
 $g(a) = a^3 + 4 + a$
Find $f(g(a))$

8) $g(x) = 4x + 4$
 $h(x) = 2x + 3$
Find $g(h(x))$

9) $f(n) = 2n^2 - 3$
 $g(n) = -3n^2 - 2n$
Find $(f \circ g)(1)$

10) $g(x) = 2x - 3$
 $h(x) = 4x - 1$
Find $g(h(-9))$