Worksheet 9.4b: Function Composition

For #1-6, find $f \circ g$ **and** $g \circ f$. **State the domain of the each new function.**

1) $f(x) = 2x - 3$ $g(x) = 3x$

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

3) $f(x) = \dfrac{1}{2}x - 3$ $g(x) = \dfrac{1}{4}x$

4) $f(x) = -3x + 3$ $g(x) = 6x$

5) $f(x) = \dfrac{3}{x+2}$ $g(x) = 4x + 1$

6) $f(x) = \sqrt{2x}$ $g(x) = 18x^2$

7) The cost function, in dollars, for producing microchips is given by $C(m) = 1.35m + 200$, where x is the number of microchips produced. The number of microchips produced is $M(t) = 20t$, where t is the number of hours of production.

      a. Give the cost, C, as a function of time, t-- find $C(M(t))$.

      b. Find the *cost* of the production run that lasts 8 hours.

      c. How many *microchips* are produced in 8 hours?

For # 8-13, given the following functions, find each composite function value.

$$h(x) = 2x + 5 \qquad g(x) = x^2 - 1 \qquad f(x) = \frac{-1}{2}x + \frac{3}{2}$$

8) $(h \circ g)(-1)$ **9)** $(f \circ g)(-6)$ **10)** $(g \circ g)(-3)$

11) $(g \circ f)(-6)$ **12)** $(h \circ f)(5)$ **13)** $(h \circ h)\left(\frac{2}{3}\right)$