

1.5 Combining Functions

1) Review

a) $(x^2 + 3x - 4) + (x^3 - 4x^2 - 5)$

b) $(x - 6)(5x + 2)$

c) $\frac{x^2 + 8x - 5}{x - 2}$

2) Find an **algebraic expression** for $r(x)$ using the given functions. **Simplify** if possible.

Examples: Let $f(x) = 3x - 5$, $g(x) = x^2 + 5x - 2$ and $h(x) = \sqrt{x} - 1$. Perform the indicated operations.

a) $r(x) = (f + g)(x)$

b) $r(x) = (f - g)(x)$

c) $r(x) = (gh)(x)$

d) $r(x) = \left(\frac{f}{h}\right)(x)$

3) Evaluate each of the following using the given functions. **SHOW WORK!**

Examples: Let $f(x) = \sqrt{x-2}$, let $g(x) = -x^2 + 3$, and $h(x) = \frac{x}{x-4}$. Evaluate the following.

a) $f(2) + g(1)$

b) $f(3) - g(-3)$

c) $f(6) \cdot 3h(2)$

d) $\frac{-2g(5)}{h(-1)}$

4) Find the indicated *composition function* and its *domain* using the given functions. **SHOW WORK!**

Examples: Let $f(x) = 3x - 5$, $g(x) = \sqrt{x}$, $h(x) = x^2 - 4$, and $k(x) = \frac{2}{x-2}$.

a) $r(x) = (f \circ g)(x)$

b) $r(x) = (f \circ f)(x)$

c) $r(x) = (k \circ g)(x)$

d) $r(x) = (k \circ k)(x)$

e) $r(x) = (h \circ g)(x)$