1. Take $f(x) = x^3$. Draw the function on the restriction $(-3, -1] \cup [1, \infty)$.

2. Take f and g to be functions with $\mathcal{D}(f) = (-\infty, 10]$, $\mathcal{D}(g) = (-5, 3] \cup (9, \infty)$, and the zero set of g is $\{3, 11\}$. Determine the domain of $f + g$, fg, and $\frac{f}{g}$.

3. Determine how $f - g$ is defined and the domain of $f - g$.

4. Take f and g to be given by

$$f(x) = 2x \quad \text{and} \quad g(x) = \sqrt{x-4}.$$

Determine a formula for $f \circ g$ and $g \circ f$. Also determine the domain of both functions.

5. Take

$$a(x) = x, \quad b(x) = x^2, \quad c(x) = x + 3, \quad d(x) = 5x, \quad \text{and} \quad e(x) = \sqrt{x}.$$

Decompose f into sums, products, quotients and or composites of more elementary functions, where

$$f(x) = x^2\sqrt{x + 5x^2} + \frac{x+3}{x}.$$