

## 1.5.1 EXERCISES

- Suppose  $f$  is a function that takes a real number  $x$  and performs the following three steps in the order given: (1) square root; (2) subtract 13; (3) make the quantity the denominator of a fraction with numerator 4. Find an expression for  $f(x)$  and find its domain.
- Suppose  $g$  is a function that takes a real number  $x$  and performs the following three steps in the order given: (1) subtract 13; (2) square root; (3) make the quantity the denominator of a fraction with numerator 4. Find an expression for  $g(x)$  and find its domain.
- Suppose  $h$  is a function that takes a real number  $x$  and performs the following three steps in the order given: (1) square root; (2) make the quantity the denominator of a fraction with numerator 4; (3) subtract 13. Find an expression for  $h(x)$  and find its domain.
- Suppose  $k$  is a function that takes a real number  $x$  and performs the following three steps in the order given: (1) make the quantity the denominator of a fraction with numerator 4; (2) square root; (3) subtract 13. Find an expression for  $k(x)$  and find its domain.
- For  $f(x) = x^2 - 3x + 2$ , find and simplify the following:

- |                                 |             |                |
|---------------------------------|-------------|----------------|
| (a) $f(3)$                      | (d) $f(4x)$ | (g) $f(x - 4)$ |
| (b) $f(-1)$                     | (e) $4f(x)$ | (h) $f(x) - 4$ |
| (c) $f\left(\frac{3}{2}\right)$ | (f) $f(-x)$ | (i) $f(x^2)$   |

- Repeat Exercise 5 above for  $f(x) = \frac{2}{x^3}$

- Let  $f(x) = 3x^2 + 3x - 2$ . Find and simplify the following:

- |             |                   |                                 |
|-------------|-------------------|---------------------------------|
| (a) $f(2)$  | (d) $2f(a)$       | (g) $f\left(\frac{2}{a}\right)$ |
| (b) $f(-2)$ | (e) $f(a + 2)$    | (h) $\frac{f(a)}{2}$            |
| (c) $f(2a)$ | (f) $f(a) + f(2)$ | (i) $f(a + h)$                  |

- Let  $f(x) = \begin{cases} x + 5, & x \leq -3 \\ \sqrt{9 - x^2}, & -3 < x \leq 3 \\ -x + 5, & x > 3 \end{cases}$

- |             |                |                 |
|-------------|----------------|-----------------|
| (a) $f(-4)$ | (c) $f(3)$     | (e) $f(-3.001)$ |
| (b) $f(-3)$ | (d) $f(3.001)$ | (f) $f(2)$      |