

Purpose: This problem set focuses on practicing function evaluation which is an essential skill moving toward analyzing functions and their behavior.

For these exercises, assume

$$f(x) = \begin{cases} \frac{x+2}{x^2+1} & \text{if } x > 3 \\ 0 & \text{if } x = 3 \\ |2x| & \text{if } x < 3 \end{cases}$$

with domain \mathbb{R} . Evaluate and simplify each of the following expressions

1. $f(2)$

3. $f(3)$

2. $f(-2)$

4. $f(x^2 + 3)$

For these exercises, assume

$$g(x) = \frac{x - 2}{x + 2}$$

1. Find a number b such that $g(b) = 3$.

2. Simplify the expression $\frac{g(x) - g(2)}{x - 2}$.

3. Simplify the expression $\frac{g(a + t) - g(a)}{t}$.

4. Simplify the expression $\frac{g(x + b) - g(x - b)}{2b}$.