1 Problems

Exercise 1. What is the domain of the function $f(x) = \sqrt{x-4}$?

Exercise 2. What is the domain of the function $f(x) = \frac{1}{x-3}$?

Exercise 3. What is the domain of the function $f(x) = x^2$?

Exercise 4. Let $f(x) = x + 1$ and $g(x) = \frac{1}{x^2}$. What is $f \circ g$? What is the domain of $f \circ g$?

Exercise 5. Let $f(x) = x + 1$ and $g(x) = \frac{1}{x^2}$. What is $g \circ f$? What is the domain of $g \circ f$?

2 Answer key

Exercise 1. $[4, \infty)$.

Exercise 2. $(-\infty, 3) \cup (3, \infty)$.

Exercise 3. $(-\infty, \infty)$.

Exercise 4. $f \circ g = \frac{1}{x^2} + 1$. The domain is $(-\infty, 0) \cup (0, \infty)$.

Exercise 5. $g \circ f = \frac{1}{(x+1)^2}$. The domain is $(-\infty, \infty)$.

3 Solutions

Exercise 1. The square root funtion is only defined on $[0, \infty)$. Since there is an $x - 4$ in the square root, x must be 4 or greater.

Exercise 2. The function has denominator $x - 3$ which is zero when $x = 3$. So it is defined everywhere but at 3.

Exercise 3. This function is defined everywhere.

Exercise 4. $f \circ g$ means you input $g(x)$ where x is in $f(x)$. The function g is only defined on $(-\infty, 0) \cup (0, \infty)$ so the composition is also only defined on this domain.

Exercise 5. $g \circ f$ means you input $f(x)$ where x is in $g(x)$. The function f is defined everywhere, so the composition is also defined everywhere.