Exercise 206

For the following exercises, use composition to determine which pairs of functions are inverses.

$$f(x) = \sqrt{4 - x^2},\ 0 \le x \le 2,\ g(x) = \sqrt{4 - x^2},\ 0 \le x \le 2$$

Solution

Take the composition of f and g and see if it results in x.

$$f \circ g = f(g(x)) = f\left(\sqrt{4 - x^2}\right) = \sqrt{4 - \left(\sqrt{4 - x^2}\right)^2} = \sqrt{x^2} = x$$

Therefore, f and g are inverses; they are reflections of one another about the line $y = x$.