

## Exercise 326

Are the following functions one-to-one over their domain of existence? Does the function have an inverse? If so, find the inverse  $f^{-1}(x)$  of the function. Justify your answer.

$$f(x) = x^2 + 2x + 1$$

### Solution

The function is a perfect square.

$$f(x) = (x + 1)^2$$

This is the graph of a parabola opening upward shifted to the left by 1 unit. Because it fails the horizontal line test,  $f(x)$  is not one-to-one and therefore does not have an inverse.

