

Name: ANSWER KEY

Score: _____

1. (2) Show that the function $f(x) = \sqrt{x}$ is one-to-one.

f is defined only for $x \geq 0$.

Let $f(a) = f(b)$

$$\Rightarrow \sqrt{a} = \sqrt{b} \Rightarrow (\sqrt{a})^2 = (\sqrt{b})^2 \Rightarrow a = b \text{ (since } a, b \geq 0) \therefore f \text{ is one-to-one.}$$

2. (4) Find the inverse function of f .

Let $y = \sqrt{x}$

② $x^2 = y$

① $x = \sqrt{y}$

③ $f^{-1}(x) = x^2$

Check: $f \circ f^{-1}(x) = f^{-1}(f(x)) = f^{-1}(\sqrt{x}) = (\sqrt{x})^2 = x$

$f \circ f^{-1}(x) = f(f^{-1}(x)) = f(x^2) = \sqrt{x^2} = x \text{ (since } x \geq 0)$

3. (4) On the same graph show the plots of f and f^{-1} .

