

$|A| = |B|$ iff there exists a bijection $f : A \rightarrow B$.

$f : A \rightarrow B$ is a bijection iff f is 1:1 and f is onto.

f is NOT a bijection iff f is not 1:1 OR f is not onto.

Determine if the following functions are bijections. If a function is not a bijection, state why and determine if you can create a bijective function by changing the co-domain.

1.) $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = x^2$

2.) $f : [0, \infty) \rightarrow \mathbb{R}, f(x) = x^2$

3.) $f : [0, \infty) \rightarrow [0, \infty), f(x) = x^2$

4.) $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = x^3$

5.) $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = 2$

6.) $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = 8x + 2$

7.) $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = x^2 + 3x$

8.) $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = e^x$

9.) $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = x^4 + x^2$

10.) $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = \sin(x)$