

Exercise Set 7.3

(a)

⑨ $g: \mathbb{Z} \rightarrow \mathbb{Z}$

$g(n) = 3n - 2$, for all integers n .

(i) If the function $g: \mathbb{Z} \rightarrow \mathbb{Z}$ is defined by the rule $g(n) = 3n - 2$, for all integers n , then g is one-to-one.

Proof:

Suppose n_1 and n_2 are integers such that $f(n_1) = f(n_2)$. [We must show that $n_1 = n_2$]

$$3n_1 - 2 = 3n_2 - 2.$$

Adding 2 to both sides gives

$$3n_1 = 3n_2,$$

and dividing both sides by 3 gives

$$n_1 = n_2,$$

which was to be shown. ✓

Consequently, if the function $g: \mathbb{Z} \rightarrow \mathbb{Z}$ is defined by the rule $g(n) = 3n - 2$, for all integers n , then g is one-to-one.

* (ii) on back *

