Homework 18, Section 4.3: 3, 7, 8, 15

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Homework

3. A)

It is invertible because the function is one-to-one and onto.

3. B)

One to one, but not onto

3. C)

One to one but not onto

3. D)

It is invertible because the function is one-to-one and onto.

7.

$f(x_1) = f(x_2)$
f is one-to-one
$2x_1 = 2x_2$
Therefore
$x_1 = x_2$

8.

Proof: since f is onto then there must be an $x \in \mathbb{R}$ with $f(x) = y$. If we take $z = \frac{x}{2} \in \mathbb{R}$ it follows that $h(z) = f(2z) = f(x)$
This shows that $h(z) = y$

15. A)

Proof
let$x_1 and x_2 \in \mathbb{R}$ be given.
Let it also be given that $y(x_1) = y(x_2)$. This means that given the function, $5x_1 = 7 = 5x_2 = 7$
This in turn means $x_1 = x_2$ meaning y is one to one.

15. B)

15. C)