4.1.1(a)
D = {a, b, c, d, e}

4.1.1(b)
T = {w, x, y, z}

4.1.3(b)
Not a function

4.1.6(a)
Equal

4.1.6(b)
Not equal, -1

4.2.2(a)
f(x) = ⌈(x * 5) / 24⌉

4.2.3(d)
-1

4.2.3(e)
2

4.3.2(a)
Not onto, the range does not have negative numbers
Not one-to-one, -1 and 1 map to 1

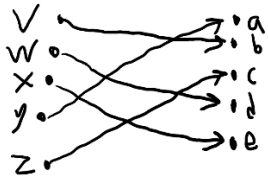
4.3.2(b)
Both

4.3.2(c)
Is not onto, range does not have 4
Is one-to-one

4.3.4(a)
Is onto
Is not one-to-one, 1111 and 0111 map to 111

4.4.1(b)

Is well defined,



4.4.2(c)

Is well-defined, $f(x)^{-1} = (x - 3) / 2$

4.4.2(h)

Is well-defined, the output of f^{-1} is obtained by taking the input string y, removing the last bit of y and adding the bit to the start of y. For example, $f^{-1}(110) = 011$

4.5.1(a)

D = {v, w, x, y, z}

4.5.1(b)

T = {1, 2, 3, 4, 5}

4.5.2(b)

121

4.5.2(e)

4^{2x}

4.5.6(a)

011

4.5.8(b)

10x + 22

4.6.1(b)

6^{6k}

4.6.1(d)

6^{3k-1}

4.6.2(a)

$\log_5 2k$

4.6.2(e)

$\log_{25} k^2$