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,**

**Letter

Description automatically generated with medium confidence**

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)

**42x**

4.5.6(a)

**011**

4.5.8(b)

**10x + 22**

4.6.1(b)

**66k**

4.6.1(d)

**63k-1**

4.6.2(a)

**log52k**

4.6.2(e)

**log25k2**