

Will Gasser

5.1.1

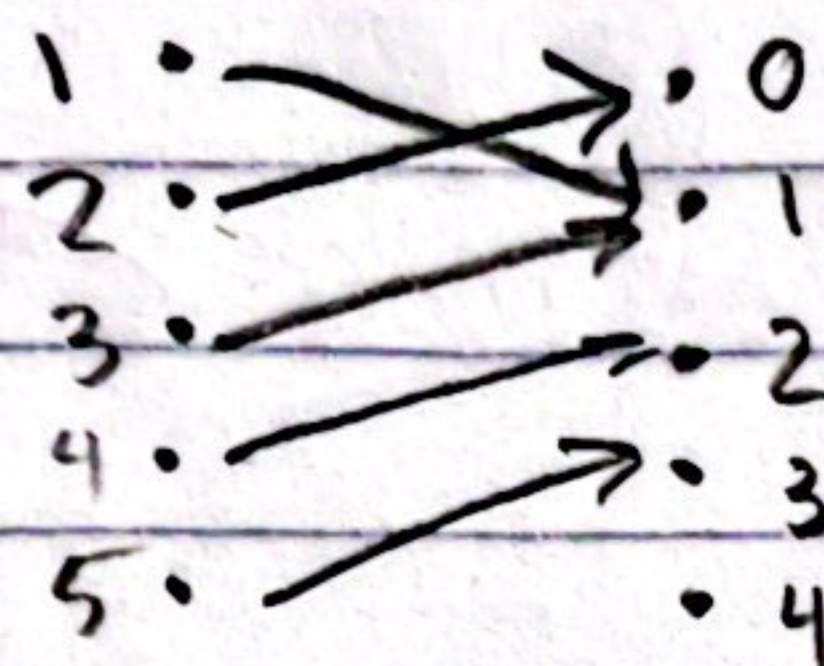
a.)  $\{a, b, c, d, e\}$

b.)  $\{w, x, y, z\}$

c.)  $\{w, y, z\}$

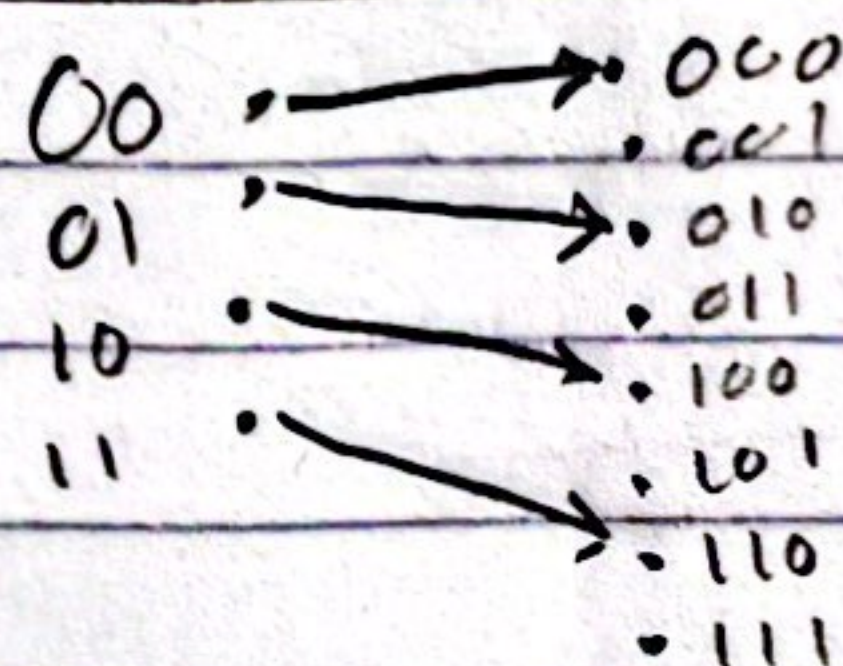
5.1.2

a.)



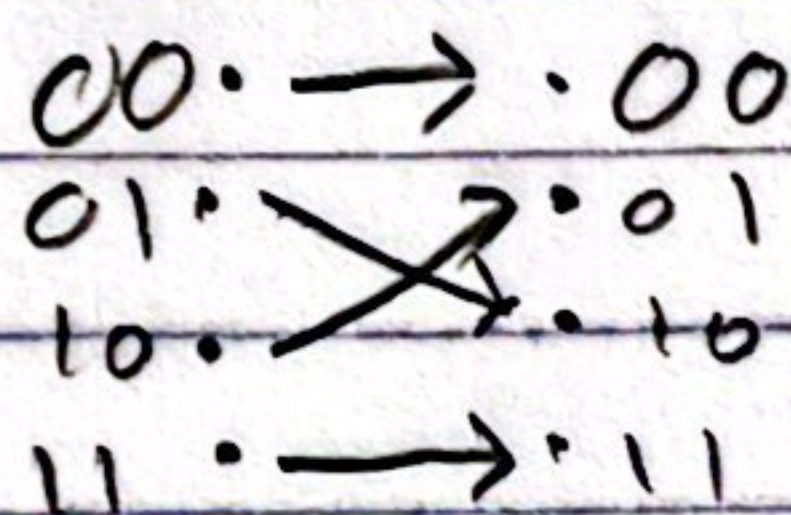
range:  $\{0, 1, 2, 3\}$

b.)



range:  $\{000, 010, 100, 110\}$

c.)



range:  $\{00, 01, 10, 11\}$

5.2.3

a.) -4

b.) -4

c.) 5

d.) -2



### 5.3.2

a.) Not onto, not one-to-one

$$\underline{-2^2 = 4, 2^2 = 4} \uparrow$$

$$x^2 \neq -1$$

not onto

b.) Both one to one and onto

c.) Not onto, one to one

$$\sqrt[3]{2} \text{ is NOT an integer}$$

d.) Onto, Not one-to-one

$$\sim \underline{f(1) = -3, f(2) = -3}$$

### 5.4.2

a.)  $f^{-1}(x) = x - 3$

b.)  $f(x)$  is not onto

c.)  $f(x) = \frac{x-3}{2}$

d.) Not a bijection, not one to one

### 5.5.2

a.)  $2^0 = 1^2 = \boxed{1}$

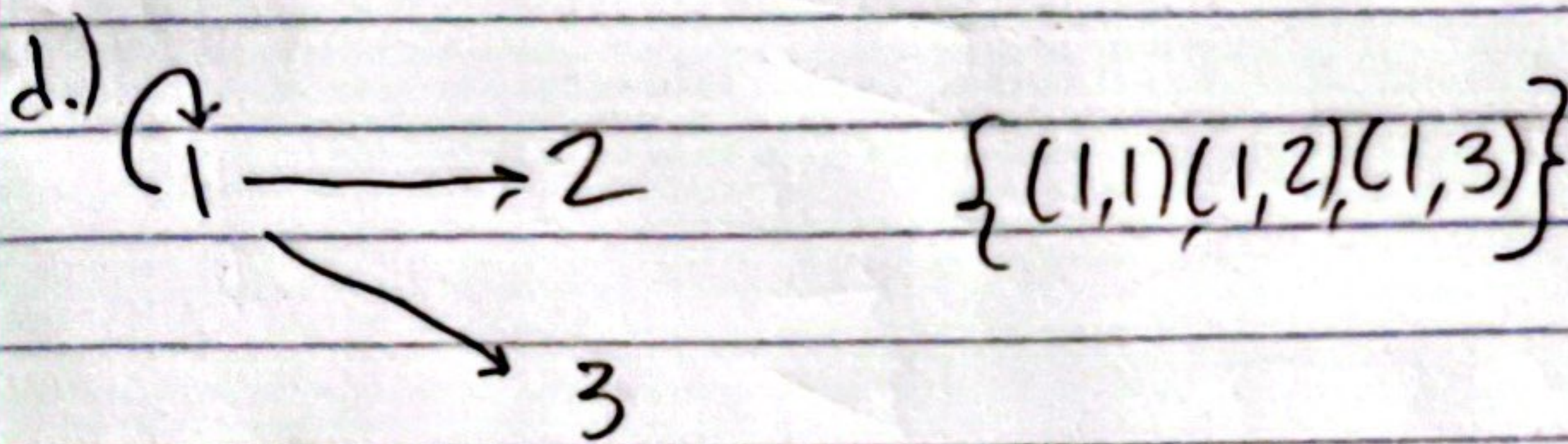
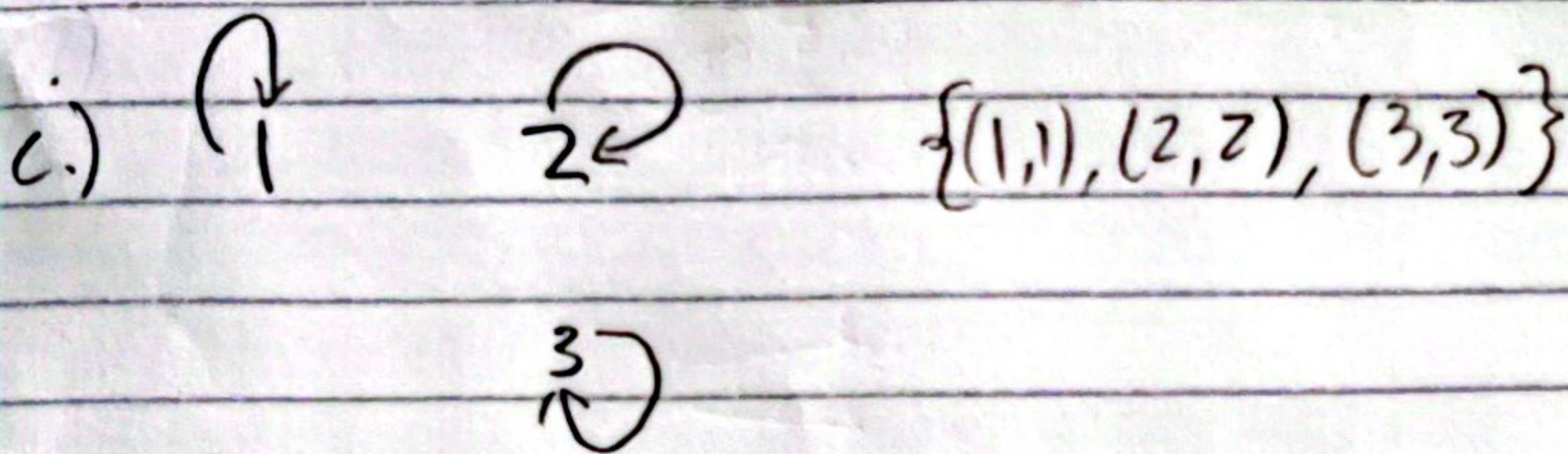
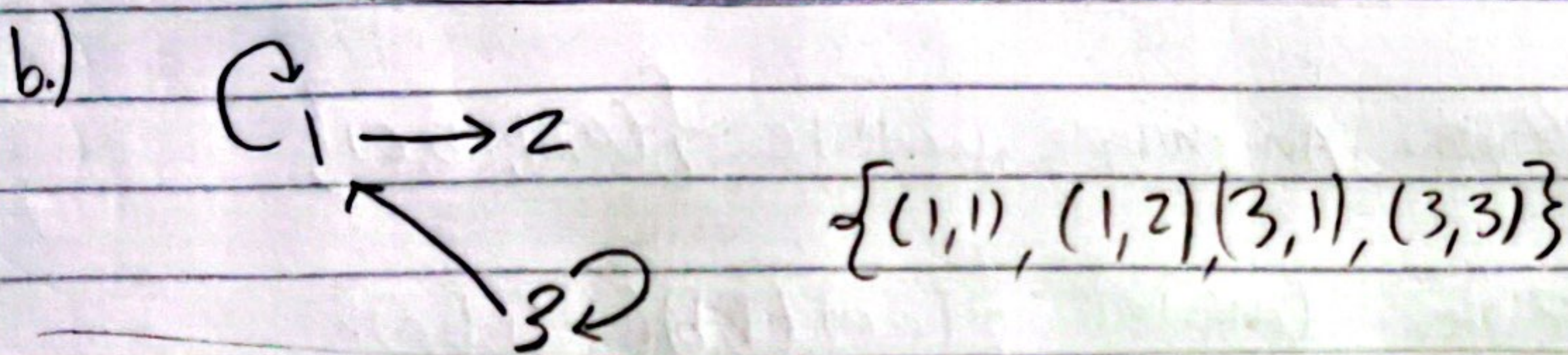
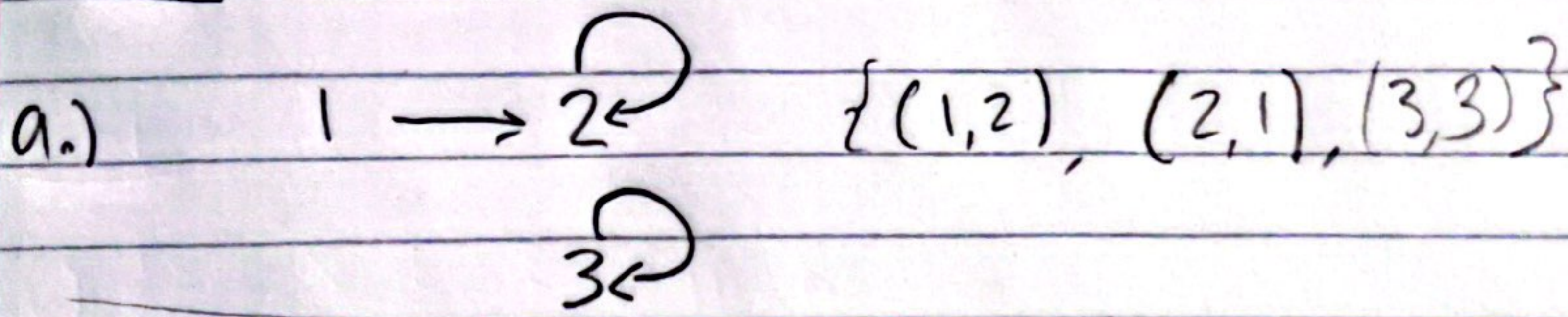
b.)  $\left[\frac{3^2}{5}\right] = 11^2 = \boxed{121}$

c.)  $4^2 = \left[\frac{16}{5}\right] = 4 \quad 2^4 = \boxed{16}$

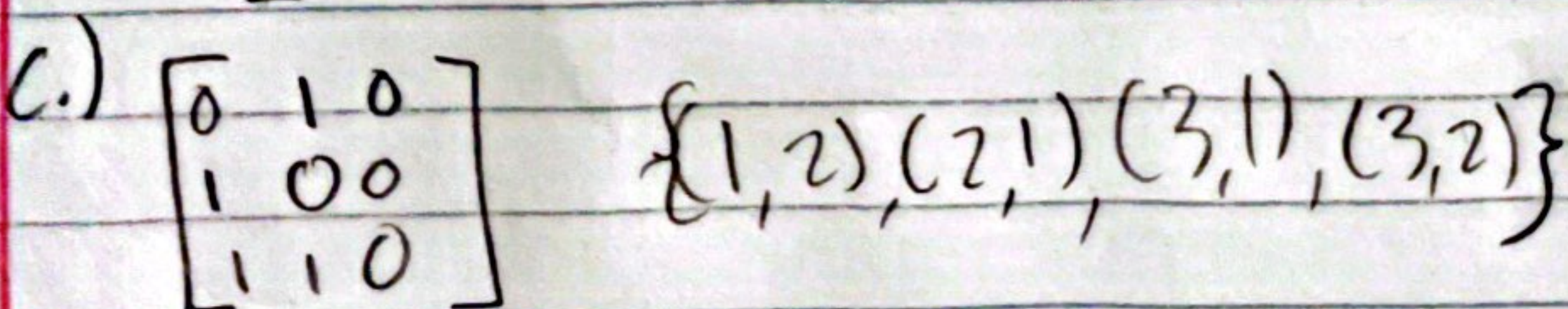
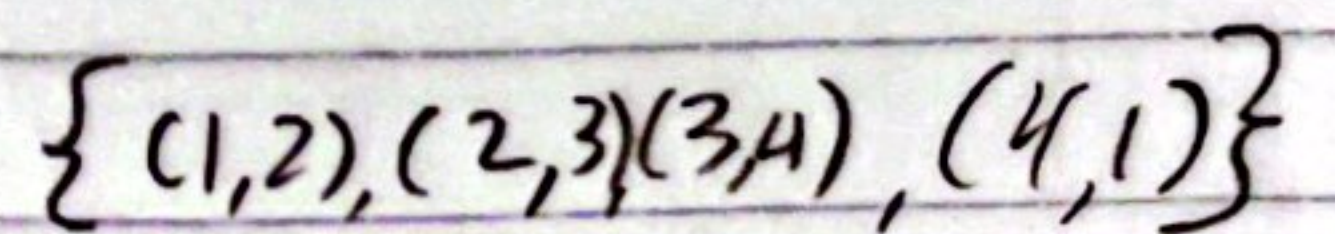
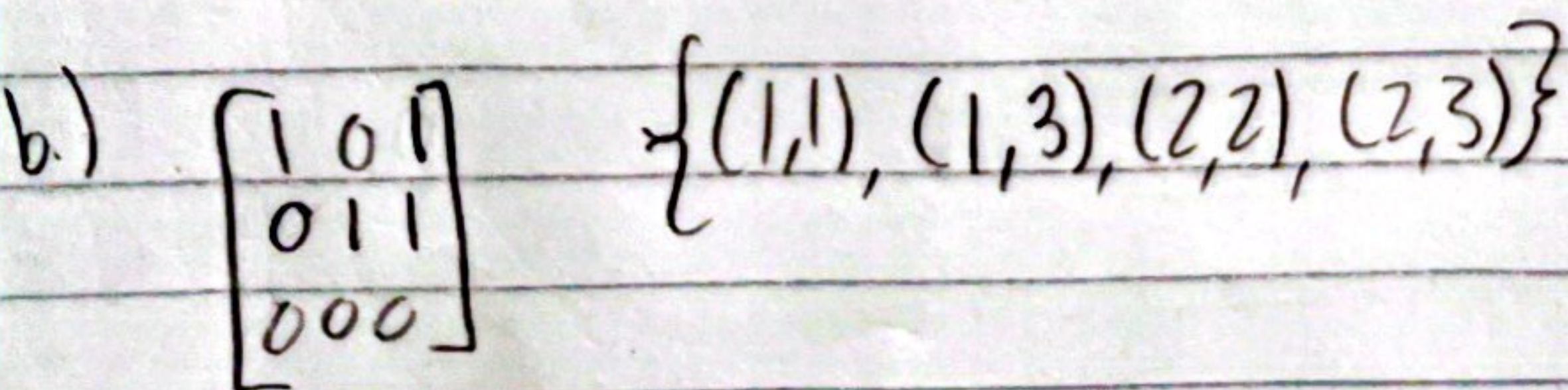
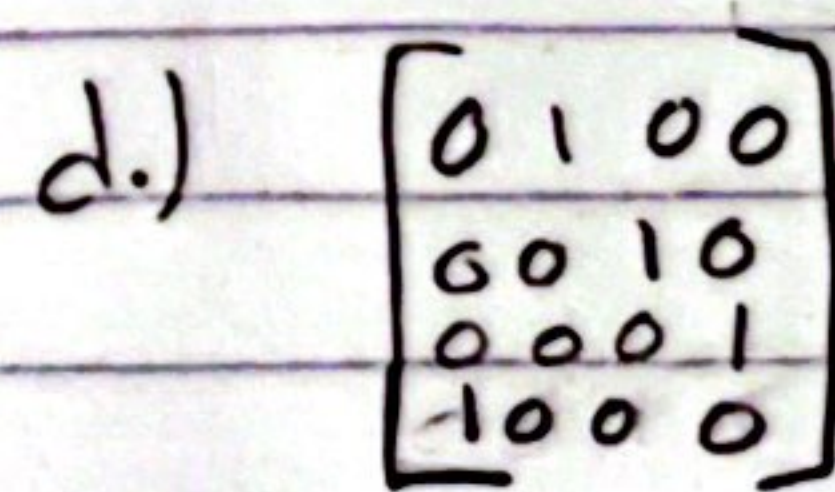
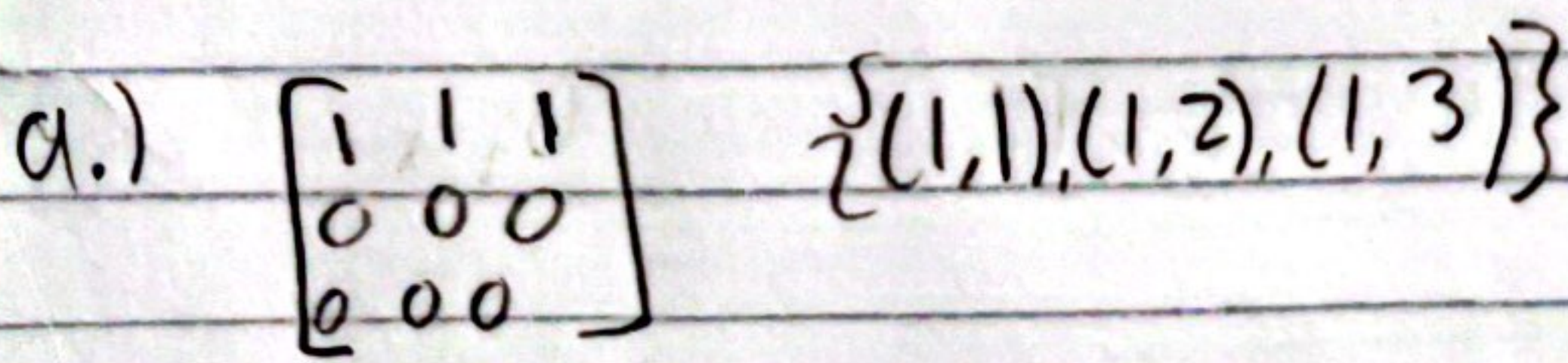
d.)  $(h \circ f) = \left[\frac{x^2}{5}\right]$



### 5.7.1



### 5.7.2





5.8.3

a.) No

b.) No

c.) Yes, it is possible. An example would be  $\{(a,b), (b,c)\}$

d.) Yes, it is possible. Consider  $\{(a,a), (b,b), (a,b), (b,a)\}$

5.9.1

a. 2

b. 2

c. 1

d. 9