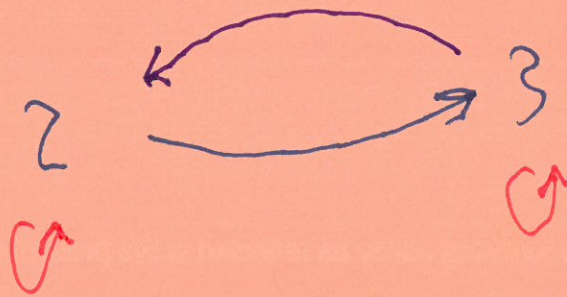
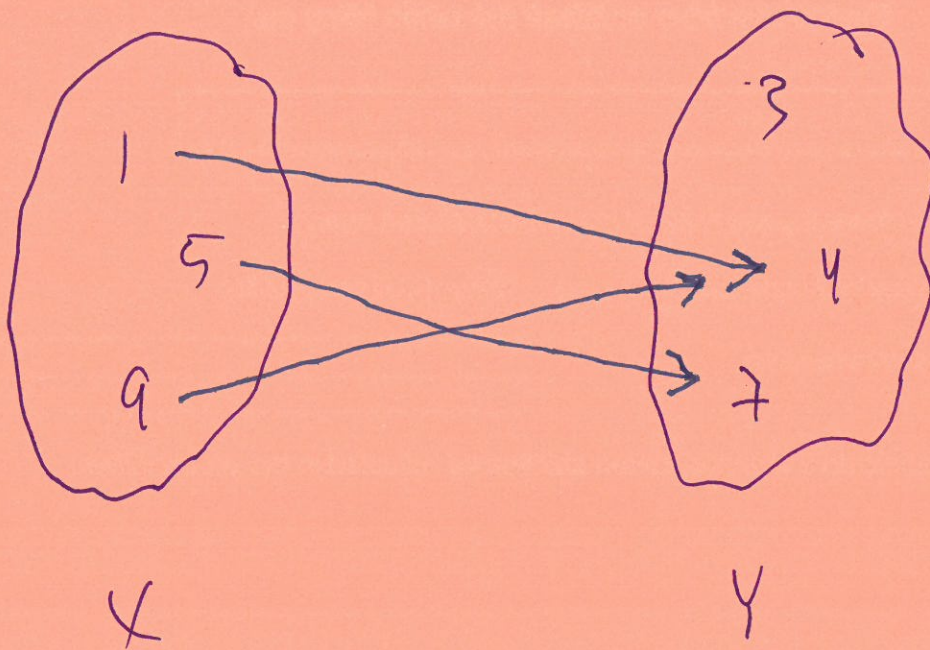


HOMEWORK 5



(~~x~~, [[0,0], [1,1]])
2

6A



$1 \in X$
 $9 \in X$

$1 \neq 9$

$f(1) = 4$
 $f(9) = 4$

Consider $3 \in Y$

$3 \neq f(x) \quad \forall x \in X$

10A

$$f: \mathbb{Z} \rightarrow \mathbb{Z}$$

$$f(n) = 2n \quad \forall n \in \mathbb{Z}$$

One-to-one?

Suppose that x_1 and x_2 are arbitrary but particular elements of X such that

$$f(x_1) = f(x_2)$$

$$2x_1 = 2x_2$$

by def'n

$$x_1 = x_2$$

divide by 2



onto?

Consider $3 \in \mathbb{Z}$

show $3 \neq f(x) \quad \forall x \in \mathbb{Z}$

$$3 = f(x) = 2x$$

$$\frac{3}{2} = x$$

$$\frac{3}{2} \notin \mathbb{Z}$$

26.

$$S(1) = 1$$

$$S(2) = 1 + 2 = 3$$

$$S(3) = 1 + 3 = 4$$

$$S(4) = 1 + 2 + 4 = 7$$

$$S(5) = 1 + 5 = 6$$

$$S(6) = 1 + 2 + 3 + 6 = 12$$

$$S(7) = 1 + 7 = 8$$

$$S(8) = 1 + 2 + 4 + 8 = 15$$

$$S(9) = 1 + 3 + 9 = 13$$

$$S(10) = 1 + 2 + 5 + 10 = 18$$

$$S(11) = 1 + 11 = 12$$

not one-to-one because $S(6) = S(11) = 12$
and $6 \neq 11$

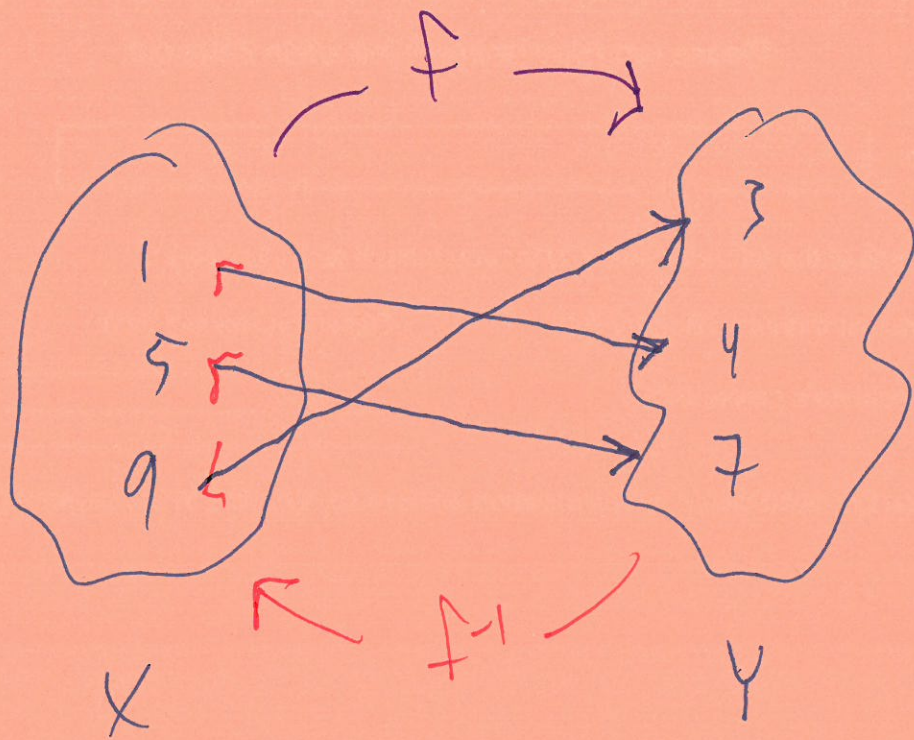
not onto, consider 2

$$S(1) = 1$$

$$\forall n \geq 2 \quad S(n) \geq 2$$

$$\therefore 2 \neq S(n) \text{ for } n \in \mathbb{Z}^+$$

44.



$$f^{-1}(3) = 1$$

$$f^{-1}(4) = 5$$

$$f^{-1}(7) = 9$$