

(#4)  $\{x \in \mathbb{N} : -2 < x \leq 7\} = \{-1, 0, 1, 2, 3, 4, 5, 6, 7\}$

-1 and 0, should not be included, since they are not in  $\mathbb{N}$

(#8)  $\{x \in \mathbb{R} : x^3 + 5x^2 = -6x\} = \{0, -2, -3\}$

$\downarrow$   
 $x(x^2 + 5x + 6) = 0$   
 or  
 $x = 0$  or  $x^2 + 5x + 6 = 0$   
 $(x+3)(x+2) = 0$   
 $x = -3, -2$

these are all the  $x \in \mathbb{R}$  that satisfy the condition!

(#12)  $\{x \in \mathbb{Z} : |2x| < 5\} = \{-2, -1, 0, 1, 2\}$

hint:  $|x| < a$  same as  $-a < x < a$

$|x| < \frac{5}{2}$   
 $\downarrow$   
 $-2.5 < x < 2.5$

(#33)  $|\{x \in \mathbb{Z} : |x| < 10\}| = |\{-9, -8, \dots, 0, 1, 2, \dots, 9\}| = 19$   
 $\downarrow$   
 $-10 < x < 10$

(#37)  $|\{x \in \mathbb{N} : x^2 < 0\}| = |\emptyset| = 0$   
 $\downarrow$   
 no such natural #

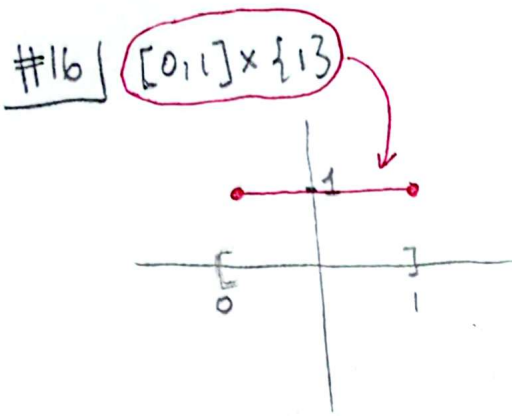
§1.2

(#2)  $A = \{\pi, e, 0\}, B = \{0, 1\}$

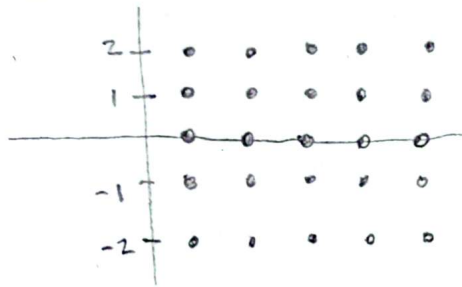
(a)  $A \times B = \{(\pi, 0), (\pi, 1), (e, 0), (e, 1), (0, 0), (0, 1)\}$

(f)  $(A \times B) \times B = \{(\pi, 0), (\pi, 1), (e, 0), (e, 1), (0, 0), (0, 1)\} \times B$

$= \{((\pi, 0), 0), ((\pi, 0), 1), ((\pi, 1), 0), ((\pi, 1), 1), ((e, 0), 0), ((e, 0), 1), ((e, 1), 0), ((e, 1), 1), ((0, 0), 0), ((0, 0), 1), ((0, 1), 0), ((0, 1), 1)\}$



(#17)  $\mathbb{N} \times \mathbb{Z}$



§1.3

(#6)  $\mathcal{P}(\{\mathbb{R}, \mathbb{Q}, \mathbb{N}\}) = \{\emptyset, \{\mathbb{R}\}, \{\mathbb{Q}\}, \{\mathbb{N}\}, \{\mathbb{R}, \mathbb{Q}\}, \{\mathbb{R}, \mathbb{N}\}, \{\mathbb{Q}, \mathbb{N}\}, \{\mathbb{R}, \mathbb{Q}, \mathbb{N}\}\}$

(#7)  $\mathcal{P}(\{\mathbb{R}, \{\mathbb{Q}, \mathbb{N}\}\}) = \{\emptyset, \{\mathbb{R}\}, \{\{\mathbb{Q}, \mathbb{N}\}\}, \{\mathbb{R}, \{\mathbb{Q}, \mathbb{N}\}\}\}$

(#11)  $\{X : X \subseteq \{3, 2, a\} \text{ and } |X| = 4\} = \emptyset$

↑  
b/c no subset of a 3-element set has four elements

(#15) T or F?

$$\{(x, y) : \underbrace{x-1=0}_{x=1}\} \stackrel{?}{\subseteq} \{(x, y) : \underbrace{x^2-x=0}_{x=0,1}\}$$

$$\{1\} \stackrel{?}{\subseteq} \{0, 1\}$$

True!

