

# 1.2 The Language of Sets

p. 13 #2-7, 9, 12

- ② a)  $x$  is an element of the set of positive real numbers strictly between 0 and 1.  
 b)  $x$  is an element of the set of real numbers less than or equal to 0 or greater than or equal to 1.  
 c)  $n$  is an element of the set of integers which are factors of 6.  
 d)  $n$  is an element of the set of positive integers which are factors of 6.

- ③ a) No.                      ④ a) Yes.    d) Yes.  
 b) 3                            b) 1        e) No.  
 c) 3                            c) 2

- ⑤  $A = \{0, 1, 2\}$   
 $B = \{x \in \mathbb{R} \mid -1 \leq x < 3\}$   
 $C = \{x \in \mathbb{R} \mid -1 < x < 3\}$   
 $D = \{x \in \mathbb{Z} \mid -1 < x < 3\}$   
 $E = \{x \in \mathbb{Z}^+ \mid -1 < x < 3\}$

$$A = D$$

- ⑥  $T_n = \{n, n^2\}$   
 $T_2 = \{2, 4\} \rightarrow \boxed{2}$   
 $T_{-3} = \{-3, 9\} \rightarrow \boxed{2}$   
 $T_1 = \{1, 1\} \rightarrow \boxed{1}$   
 $T_0 = \{0, 0\} \rightarrow \boxed{1}$

- ⑦ a)  $S = \{-1, 1\}$   
 b)  $T = \{0, 2\}$   
 c)  $U = \{ \}$   
 d)  $V = \{s \in \mathbb{Z}\}$   
 e)  $W = \{ \}$   
 f)  $X = \{u \in \mathbb{Z}\}$

- ⑧ a) Yes.                      f) No.  
 b) No.                        g) Yes.  
 c) No.                        h) No.  
 d) Yes.                      i) Yes.  
 e) Yes.                      j) Yes.

- ⑫ a)  $S \times T = \{(2, 1), (4, 1), (6, 1), (2, 3), (4, 3), (6, 3), (2, 5), (4, 5), (6, 5)\}$

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- b)  $T \times S = \{(1, 2), (3, 2), (5, 2), (1, 4), (3, 4), (5, 4), (1, 6), (3, 6), (5, 6)\}$

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- c)  $S \times S = \{(2, 2), (4, 2), (6, 2), (2, 4), (4, 4), (6, 4), (2, 6), (4, 6), (6, 6)\}$

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- d)  $T \times T = \{(1, 1), (3, 1), (5, 1), (1, 3), (3, 3), (5, 3), (1, 5), (3, 5), (5, 5)\}$

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