

Example 5. Write each set using the set-builder notation. The answers will vary based on individuals.

(a) the set of multiples of 3.

$$= \{x \mid x = 3k, \text{ } k \text{ is an integer}\} \text{ or}$$

$$= \{x \mid x = 3k, \text{ } k \in \mathbb{Z}\}, \text{ where } \mathbb{Z} \text{ is the set of all the integers.}$$

(b) $\{-12, -8, -4, 0, 4, 8, 12, 15\}$

$$= \{x \mid x = 4k, \text{ } k = -3, -2, -1, 0, 1, 2, 3\} \text{ or}$$

$$= \{x \mid x = 4k, \text{ } k \in \mathbb{Z}, -3 \leq k \leq 3\} \text{ or}$$

$$= \{x \mid x = 4k, -12 \leq x \leq 12\}$$

(c) the set of states in the U.S.

$$= \{x \mid x \text{ is a state in the U.S.}\}$$