

Section 1.1: Sets

Exercises

Are the following sets equal?

1. $\{1, 1, 1, 2, 2, 3\}$ and $\{1, 2, 2, 3, 3, 3\}$
2. $\{1, 2, 3\}$ and $\{3, 2, 1\}$
3. $\{4, 5, 6\}$ and $\{x \mid x \text{ is a natural number between 4 and 6}\}$
4. $\{x \mid x \text{ is a natural number less than 5}\}$ and $\{y \mid y \text{ is an integer less than 5}\}$
5. $\{x \mid x \text{ is a natural number between 1 and 2}\}$ and \emptyset
6. $\{0\}$ and $\{x \mid x \text{ is a natural number less than 1}\}$

State whether the following sets are finite or infinite.

7. $\{x \mid x \text{ is an integer between 5 and 18}\}$
8. $\{x \mid x \text{ is a negative natural number}\}$
9. $\{x \mid x \text{ is a negative integer}\}$

Write each set by listing its elements.

10. $\{x \mid x \text{ is an odd integer}\}$
11. $\{y \mid y \text{ is an even natural number between 35 and 42}\}$
12. $\{y \mid y \text{ is an even natural number less than 92}\}$
13. $\{z \mid z \text{ is a letter in the word "college"}\}$

Write each set using set-builder notation. (There is more than one possible answer.)

14. $\{\dots -8, -6, -4, -2\}$
15. $\{22, 23, 24\}$

Let $A = \{2, 4, 6, 8\}$, $B = \{y \mid y \text{ is an even natural number}\}$, $C = \{2, 4, 6, 8, \dots\}$, $Z = \{z \mid z \text{ is an integer}\}$. State whether the following are true or false.

16. $3 \in C$

17. $3 \notin B$

18. $\{3\} \in Z$