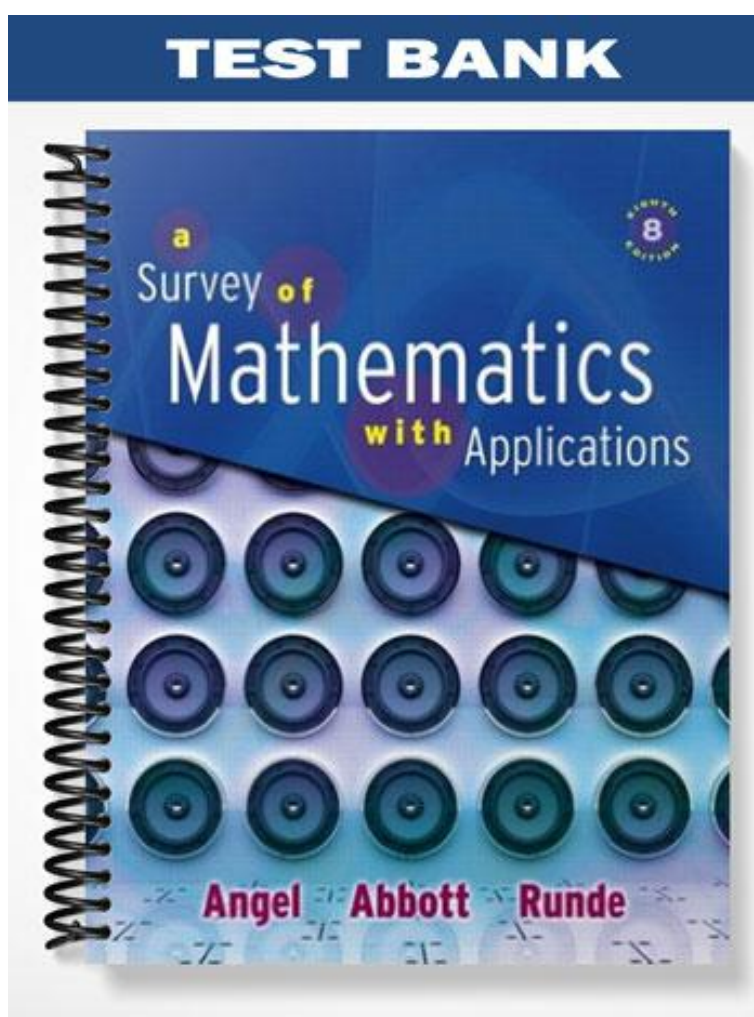


# TEST BANK



a  
Survey of  
**Mathematics**  
with Applications

EIGHTH  
EDITION  
8

Angel Abbott Runde

# A Survey of Mathematics with Applications, 8e

## Chapter 2 – Sets

## Form 1

In Exercises 1-9, determine whether each is true or false. If the statement is false, explain why.

1.  $7 \in \{1, 3, 5, 7\}$ .
2.  $\{1, 2, 3\}$  is equivalent to  $\{1, 2, 3, 4\}$ .
3.  $\{b, a, t\}$  has eight subsets.
4.  $\{\text{dog}\} \subset \{\text{cat}, \text{dog}, \text{mouse}\}$ .
5.  $\{ \} = \emptyset$ .
6.  $\{\text{rose}, \text{tulip}, \text{lily}\} = \{\text{rose}, \text{lily}, \text{daisy}\}$
7.  $\{5\} \subseteq \{x \mid x \in \mathbb{N} \text{ and } x \leq 5\}$ .
8. The set of even natural numbers greater than 100 is an infinite set.
9. For any set  $A$ ,  $A \cap A' = \emptyset$ .

In Exercises 10-11, use set  $A = \{2, 4, 6, 8, 10, 12, 14\}$ .

10. Write set  $A$  using set builder notation.
11. Express set  $A$  with a written description.

In Exercises 12-15, use the following information:

$$U = \{1, 2, 3, 4, 5, 6, 7, 8\}$$

$$A = \{2, 4, 6, 8\}$$

$$B = \{1, 3, 5, 7\}$$

$$C = \{1, 2, 3, 4\}$$

Determine the following.

12.  $A \cap C$
13.  $A \cup B'$
14.  $B \cup (A \cap C')$
15.  $n(B \cap C)$
16. Using the sets provided for Exercises 12-15, draw a Venn diagram illustrating the relationship among the sets.
17. Use a Venn diagram to determine whether  $(B \cup C)' = B' \cap C'$  for all sets  $B$  and  $C$ . Show your work.
18. The Ice Cream Shoppe surveyed its customers about their preferences of three ice cream flavors. The results of the survey showed:

170 people liked vanilla.  
135 people liked chocolate.  
103 people liked strawberry.  
100 people liked vanilla and chocolate.  
74 people liked vanilla and strawberry.  
52 people liked chocolate and strawberry.  
35 people liked all three flavors.  
7 people did not like any of the three flavors.

Draw a Venn diagram to represent this situation and then determine how many people...

- a) Completed the survey.
  - b) Liked only strawberry.
  - c) Liked vanilla and chocolate, but not strawberry.
  - d) Liked vanilla or chocolate, but not strawberry.
  - e) Liked exactly two flavors.
  - f) Liked only one flavor.
19. Show that the following set is infinite by setting up a one-to-one correspondence between the set and a proper subset of itself:  $\{5, 10, 15, 20, \dots\}$
  20. Show that the following set has cardinal number  $\aleph_0$  by setting up a one-to-one correspondence between the set of counting numbers and the given set:  
 $\{10, 20, 30, 40, \dots\}$