Mathematical Applications for the Management Life and Social Sciences 13th edition Harshbarger Test Bank

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Name:_____ Class:_____ Date:_____

0.1 Sets

1. Use $\in$ or $\notin$ in blank place to indicate whether the given object is an element of the given set.

3 ___ $\{1, 2, 3, 4, 5, 6\}$

a. $3 \in \{1, 2, 3, 4, 5, 6\}$
b. $3 \notin \{1, 2, 3, 4, 5, 6\}$

ANSWER: a

2. Use $\in$ or $\notin$ in blank place to indicate whether the given object is an element of the given set.

2 ___ $\{x : x$ is a natural number greater than $2\}$

a. $2 \in \{x : x$ is a natural number greater than $2\}$
b. $2 \notin \{x : x$ is a natural number greater than $2\}$

ANSWER: b

3. Use $\in$ or $\notin$ in blank place to indicate whether the given object is an element of the given set.

9 ___ $\{x : x$ is a natural number less than $9\}$

a. $9 \in \{x : x$ is a natural number less than $9\}$
b. $9 \notin \{x : x$ is a natural number less than $9\}$

ANSWER: b

4. Use $\in$ or $\notin$ in blank place to indicate whether the given object is an element of the given set.

7 ___ $\emptyset$

a. $7 \in \emptyset$
b. $7 \notin \emptyset$

ANSWER: b

5. Write the following set a second way.

$\{x : x$ is a natural number greater than 8 and less than $12\}$

a. $\{8, 9, 10, 11\}$
b. $\{8, 9, 10\}$
c. $\{9, 10, 11\}$
d. $\{9, 10, 11, 12\}$
e. $\{7, 8, 9, 10\}$

ANSWER: c

6. Write the following set a second way.

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Name:_____ Class:_____ Date:_____

0.1 Sets

$\{8, 9, 10, 11, \ldots\}$

a. $\{x: x \text{ is a natural number greater than 7 and less than 12}\}$
b. $\{x: x \text{ is a natural greater than 8 and less than 11}\}$
c. $\{x: x \text{ is a natural number greater than 9}\}$
d. $\{x: x \text{ is a natural number greater than 8}\}$
e. $\{x: x \text{ is a natural number greater than 7}\}$

ANSWER: e

7. If $A = \{a, b, c, d\}$ and $B = \{a, d, b, c\}$, is A a subset of B?

a. yes
b. no

ANSWER: a

8. Is $A \subseteq B$, if $A = \{2, 5, 8, 10\}$ and $B = \{2, 5, 8, 11, 16, 17\}$?

a. yes
b. no

ANSWER: b

9. Use $\subseteq$ notation to indicate which of the sets E and F is a subset of the other.

$E = \{b, k, p, s\}$, $F = \{p, 4, k, s, 8, b\}$

a. $F \subseteq E$
b. $E \subseteq F$
c. $E \subseteq U$
d. $F \subseteq E$ and $E \subseteq F$
e. $F \supseteq E$ and $F \subseteq E$

ANSWER: b

10. Use $\subseteq$ notation to indicate all containment relations between the following two sets.

$D = \{a, e, 1, 3, c\}$, $F = \{3, c, e, 1, a\}$

a. $F \supseteq D$
b. $D \subseteq U$
c. $D \supseteq F$
d. $D \subseteq F$ and $F \subseteq D$
e. $D \subseteq F$ and $F \supseteq D$

ANSWER: d

11. Indicate whether the following sets are equal.

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0.1 Sets

$A = \{x, g, a, f\}$, $D = \{x, a, b, y\}$

a. $A \neq D$
b. $A = D$

ANSWER: a

12. Indicate whether the following sets are equal.

$F = \{x: x \text{ is a natural number greater than } 9\}$, $G = \{10, 11, 12, \ldots\}$

a. $F = G$
b. $F \neq G$

ANSWER: a

13. If the sets A and B are nonempty and disjoint, what does $A \cap B$ equal?

a. $\varnothing$
b. $A \cap A'$
c. A
d. B
e. $A \cup B$

ANSWER: a

14. Find $A \cap B$, the intersection of sets A and B.

$A = \{2, 3, 4, 5, 6\}$ and $B = \{6, 8, 10, 12, 14\}$

a. $A \cap B = \{6, 7, 9, 11, 13\}$
b. $A \cap B = \{3, 5\}$
c. $A \cap B = \{6, 8, 10, 12, 14\}$
d. $A \cap B = \{2, 3, 4, 5, 6\}$
e. $A \cap B = \{6\}$

ANSWER: e

15. Find $A \cap B$, the intersection of sets A and B.

$A = \{a, b, c, d, e\}$ and $B = \{d, f, e, x, a, k\}$

a. $A \cap B = \{f, x, k\}$
b. $A \cap B = \{d, e, a\}$
c. $A \cap B = \{d, f, e\}$
d. $A \cap B = \{x, a, k\}$

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0.1 Sets

e. $A \cap B = \{d, a, k\}$

ANSWER: b

16. Find $A \cap B$, the intersection of sets A and B.

$A = \{x: x \text{ is a natural number less than } 4\}$
$B = \{1, 2, 3, 4, 5, 6\}$

a. $A \cap B = \emptyset$

b. $A \cap B = \{1, 2, 3\}$

c. $A \cap B = \{4, 5, 6\}$

d. $A \cap B = \{1, 2, 3, 4, 5, 6\}$

e. $A \cap B = \{-2, -1, 0, 1, 2, 3\}$

ANSWER: b

17. Find $A \cup B$, the union of sets A and B.

$A = \{b, e, n, p, y\}$ and $B = \{a, b, c, d\}$

a. $A \cup B = \{e, n, p, y\}$

b. $A \cup B = \{a, b, c, d\}$

c. $A \cup B = \{a, b, c, d, e, n, p, y\}$

d. $A \cup B = \{b, e, n, p, y\}$

e. $A \cup B = \{a, c, d, e, y\}$

ANSWER: c

18. Find $A \cup B$, the union of sets A and B.

$A = \{x: x \text{ is a natural number greater than } 11\}$
$B = \{x: x \text{ is a natural number less than } 11\}$

a. $A \cup B = \{x: x \text{ is a natural number greater than or equal to } 11\}$

b. $A \cup B = \{11\}$

c. $A \cup B = \{x: x \text{ is a natural number not equal to } 11\}$

d. $A \cup B$ is a set of natural numbers.

e. $A \cup B = \{x: x \text{ is a natural number less than } 11\}$

ANSWER: c

19. Assume that $A = \{7, 8, 9\}$ and that U is the universal set of natural numbers less than 11. Find A'.

a. $A' = \{1, 2, 3, 4, 5, 6, 8, 10\}$

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0.1 Sets

b. $A' = \{1, 2, 3, 4, 5, 6, 10\}$

c. $A' = \{7, 8, 9\}$

d. $A' = \{7, 8, 9, 10\}$

e. $A' = \{1, 2, 3, 7, 8, 9\}$

ANSWER: b

20. Assume that $A = \{1, 3, 5, 8\}$, $B = \{1, 2, 3, 6, 10\}$ and that U is the universal set of natural numbers less than 11. Find $A \cap B'$.

a. $A \cap B' = \{1, 3, 5, 8\}$

b. $A \cap B' = \{2, 6, 10\}$

c. $A \cap B' = \{5, 8\}$

d. $A \cap B' = \{1, 3\}$

e. $A \cap B' = \{4, 5, 7, 8, 9\}$

ANSWER: c

21. Assume that $A = \{1, 3, 5, 8\}$, $B = \{1, 2, 3, 6, 10\}$ and that U is the universal set of natural numbers less than 11. Find $A' \cap B'$.

a. $A' \cap B' = \{2, 5, 8, 9\}$

b. $A' \cap B' = \{1, 3\}$

c. $A' \cap B' = \{1, 3, 6, 8\}$

d. $A' \cap B' = \{4, 7, 9\}$

e. $A' \cap B' = \{2, 5, 8, 9\}$

ANSWER: d

22. Assume that $A = \{2, 4, 6, 9\}$, $B = \{1, 2, 5, 7, 8\}$ and that U is the universal set of natural numbers less than 11. Find $(A \cap B)'$.

a. $(A \cap B)' = \{1, 3, 4, 5, 6, 7, 8, 9, 10\}$

b. $(A \cap B)' = \{1, 3, 6, 8, 10\}$

c. $(A \cap B)' = \{1, 2, 5, 8, 9\}$

d. $(A \cap B)' = \{2, 6, 7\}$

e. $(A \cap B)' = \{1, 2, 5, 6, 8, 9\}$

ANSWER: a

23. Assume that $A = \{2, 4, 6, 9\}$, $B = \{2, 5, 6, 7, 8, 10\}$ and that U is the universal set of natural numbers less than 11. Find $(A' \cup B)'$.

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0.1 Sets

a. $(A' \cup B)' = \{4, 9\}$

b. $(A' \cup B)' = \{2, 6\}$

c. $(A' \cup B)' = \{5, 7, 8, 10\}$

d. $(A' \cup B)' = \{4, 10\}$

e. $(A' \cup B)' = \{5\}$

ANSWER: a

24. Assume that $A = \{1, 3, 5, 8\}$, $B = \{3, 4, 5\}$, $C = \{2, 3, 5, 6\}$ and that U is the universal set of natural numbers less than 11. Find $A \cap (B' \cup C')$.

a. $A \cap (B' \cup C') = \{1, 3, 5, 7\}$

b. $A \cap (B' \cup C') = \{1, 2, 7\}$

c. $A \cap (B' \cup C') = \{1, 8\}$

d. $A \cap (B' \cup C') = \{3, 8\}$

e. $A \cap (B' \cup C') = \{1, 3, 4, 7, 9\}$

ANSWER: c

25. Assume that $A = \{2, 3, 4, 7\}$, $B = \{3, 4, 5\}$, $C = \{1, 4, 5, 7\}$ and that U is the universal set of natural numbers less than 11. Find $A \cap (B \cup C)$.

a. $A \cap (B \cup C) = \{1, 2, 3, 5, 8\}$

b. $A \cap (B \cup C) = \{3, 4, 7\}$

c. $A \cap (B \cup C) = \{1, 3, 4\}$

d. $A \cap (B \cup C) = \{1, 2, 3, 4, 5, 7\}$

e. $A \cap (B \cup C) = \{4, 5\}$

ANSWER: b

26. Find $A - B$ if the universal set $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.

$A = \{1, 2, 3, 6, 9\}$, $B = \{1, 3, 5, 6, 7\}$

a. $A - B = \emptyset$

b. $A - B = \{1, 4, 5\}$

c. $A - B = \{8, 9\}$

d. $A - B = \{3, 5, 7\}$

e. $A - B = \{2, 9\}$

ANSWER: e

27. Find $A - B$ if the universal set $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.

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0.1 Sets

$A = \{4, 5, 6, 1, 3, 2\}$, $B = \{1, 2, 3, 4, 5, 6\}$

a. $A - B = \emptyset$
b. $A - B = \{1, 2, 3, 4, 5, 6\}$
c. $A - B = \{2, 4, 6, 8\}$
d. $A - B = \{2, 5, 6, 9\}$
e. $A - B = \{1, 2, 3, 5, 8\}$

ANSWER: a

28. Find $A - B$ if the universal set $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$.

$A = \{1, 2, 3, 4, 5\}$, $B = \{2, 3, 4, 7, 9\}$

a. $A - B = \emptyset$
b. $A - B = \{1, 5\}$
c. $A - B = \{2, 3, 4\}$
d. $A - B = \{7, 8, 9\}$
e. $A - B = \{3, 5\}$

ANSWER: b

29. Suppose that a survey of 100 advertisers in *U.S. News*, *These Times*, and *World* found the following.

2 advertised in all three
21 advertised in *These Times* and *U.S. News*
7 advertised in *World* and *U.S. News*
15 advertised in *World* and *These Times*
35 advertised in *These Times*
29 advertised in *U.S. News*
21 advertised in *World*

How many advertised in none of these publications?

a. 15
b. 85
c. 56
d. 95
e. 0

ANSWER: c

30. Suppose that a survey of 66 advertisers in *U.S. News*, *These Times*, and *World* found the following.

4 advertised in all three
12 advertised in *These Times* and *U.S. News*
23 advertised in *World* and *U.S. News*
24 advertised in *World* and *These Times*
34 advertised in *These Times*

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0.1 Sets

39 advertised in *U.S. News*
48 advertised in *World*

How many advertised only in *These Times*?

a. 2
b. 121
c. 34
d. 6
e. 66

ANSWER: a

31. Suppose that a survey of 100 advertisers in *U.S. News*, *These Times*, and *World* found the following.

6 advertised in all three
13 advertised in *These Times* and *U.S. News*
16 advertised in *World* and *U.S. News*
20 advertised in *World* and *These Times*
32 advertised in *These Times*
29 advertised in *U.S. News*
35 advertised in *World*

How many advertised in *U.S. News* or *These Times*?

a. 48
b. 96
c. 11
d. 17
e. 18

ANSWER: a

32. In a survey of the dining preferences of 36 dormitory students at the end of the spring semester, the following facts were discovered about Adam's Lunch *AL*, Pizza Tower *PT*, and the Dining Hall *DH*.

13 liked *AL* but not *PT*
1 liked *AL* only
21 liked *AL*
20 liked *PT*
25 liked *DH*
7 liked *PT* and *AL* but not *DH*
10 liked *PT* and *DH*

How many liked *PT* or *DH*?

a. 15
b. 16
c. 99
d. 6
e. 35

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0.1 Sets

ANSWER: e

33. In a survey of the dining preferences of 46 dormitory students at the end of the spring semester, the following facts were discovered about Adam's Lunch *AL*, Pizza Tower *PT*, and the Dining Hall *DH*.

23 liked *AL* but not *PT*
11 liked *AL* only
39 liked *AL*
18 liked *PT*
27 liked *DH*
7 liked *PT* and *AL* but not *DH*
10 liked *PT* and *DH*

How many liked all three?

a. 26
b. 14
c. 101
d. 9
e. 46

ANSWER: d

34. In a survey of the dining preferences of 54 dormitory students at the end of the spring semester, the following facts were discovered about Adam's Lunch *AL*, Pizza Tower *PT*, and the Dining Hall *DH*.

24 liked *AL* but not *PT*
20 liked *AL* only
37 liked *AL*
24 liked *PT*
22 liked *DH*
9 liked *PT* and *AL* but not *DH*
12 liked *PT* and *DH*

How many liked only *DH*?

a. 10
b. 6
c. 74
d. 18
e. 22

ANSWER: b

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