

Applied Topics in Math
2.1 to 2.2 Quiz

Name _____

Each question is worth 5 points. Good luck!

For #1-10, indicate whether each statement is true or false.

Given: $A = \{3, 5\}$ $B = \{1, 2, 3, 5, 7, 8, 9\}$ $C = \{2, 8, 9\}$ $D = \{1, 5, 6\}$

1. $A \subset B$

1. T

2. $B \subseteq A$

2. False To many elements in B

3. Set C has 8 subsets.

$2^3 = 8$ 3. True

4. $D \subset B$

4. F miss 6

5. $3 \in C$

5. F no 3

6. $B \subset B$

6. F $B \subseteq B$

7. $\{\} \subseteq D$

7. T

8. Equal sets are always equivalent.

8. T

9. Equivalent sets are always equal.

9. F cardinal # for equivalent

10. $5 \subseteq A$

10. F $\{5\}$

11. $A \subseteq B$

11. T

12. Set B has 128 proper subsets.

$2^7 - 1 = 127$ 12. False

For #13-15, express each set in roster form.

13. The set of natural numbers between 20 and 80.

$$\{21, 22, \dots, 79, \dots\}$$

14. $A = \{x \mid x \in \mathbb{N} \text{ and } x \text{ is odd}\}$

$$\{1, 3, 5, 7, \dots\}$$

15. The set of states in the U.S. that begin with Q.

$$\emptyset \text{ or } \{\}$$

For #16-17, express each set in set-builder notation.

16. $E = \{3, 4, 5, 6, 7, 8\}$

$$E = \{x \mid x \in \mathbb{N} \text{ and } 3 \leq x \leq 8\}$$

17. Set F is the set of even natural numbers.

$$F = \{x \mid x \in \mathbb{N} \text{ and even}\}$$

For #18-20, show how you arrive at your final solution.

18. Mrs. Laird is buying a house and must choose which options she would like to have in her new home to include in the contract. The options include: security system, deck, front porch, fireplace, and a pencil sharpener in the basement. How many different variations of the options are possible?

$$18. \quad 2^5 = 32$$

19. Customers ordering hamburgers at Avery and Greg's Hamburger stand are given choices for toppings for their burger. The toppings include: ketchup, mustard, onions, relish, hot sauce, bbq sauce, lettuce, and tomato. How many different variations are there for ordering a hamburger?

$$19. \quad 2^8 = 256$$

20. Emily is signing up for dance lessons at a new studio. The classes offered at the studio include: ballet, jazz, tap, lyrical, hip hop, and ballroom. How many different combinations of classes are offered at the studio?

$$20. \quad 2^6 = 64$$

Section 2.3 Review

4-
 $\{1, 2, 3, 5, 8, 9, 10\}$

$B' = \{5, 6, 10\}$

$C' = \{1, 3, 4, 5, 6, 7, 10\}$

$C = \{2, 8, 9\}$ $D = \{1, 5, 6\}$

$D' = \{2, 3, 4, 7, 8, 9\}$

1. $A = \{4, 6, 7\}$ $B = \{1, 2, 3, 4, 7, 8, 9\}$
 $U = \{1, 2, 3, 4, 5, 6, \dots, 10\}$

Determine the following.

a) $A \cap B$

$\{4, 7\}$

b) $B \cap C'$

$\{1, 3, 4, 7\}$

$\{4, 7\} \cup \{1, 2, 5, 6, 8, 9\}$

c) $B \cup D$

$\{1, 5, 6, 10\}$

d) $(A \cap B) \cup (C \cup D)$

$\{1, 2, 4, 5, 6, 7, 8, 9\}$

$A' = \{8, 10, 13, 14\}$ $B' = \{2, 10, 16\}$

2. Given: $U = \{2, 4, 6, 8, 10, 12, 14, 16\}$ $A = \{2, 4, 6, 16\}$ $B = \{4, 6, 8, 12, 14\}$ $C = \{10, 14\}$

Determine the following:

a) $B \cap C$

$\{14\}$

b) $A' \cap B'$

$\{10\}$

c) $A \cap (B' \cup C)$

$A = \{2, 4, 6, 16\}$

$B' \cup C = \{2, 10, 14, 16\}$

$\{2, 16\}$

d) $n(B \cup C)'$

$B \cup C = \{4, 6, 8, 10, 12, 14\}$

$(B \cup C)' = \{2, 16\}$

$\rightarrow = 2$

$$U = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\} \quad A = \{2, 4, 8, 10\} \quad B = \{2, 4, 14, 16\} \quad C = \{4, 14, 18\}$$

Determine the following

3. $A - B$

$$\cancel{2} \ \cancel{4} \ \cancel{8} \ 10 \\ \{8, 10\}$$

4. $A - C$

$$2 \ \cancel{4} \ \cancel{8} \ 10 \\ \{2, 8, 10\}$$

5. $(B - C)'$

$$B - C = \{2, 16\} \\ (B - C)' = \{4, 6, 8, 10, 12, 14, 18, 20\}$$

6. $(C - A)' - B$

$$C - A = \{14, 18\} \\ (C - A)' = \{2, 4, 6, 8, 10, 12, 16, 20\} \\ (C - A)' - B = \{6, 8, 10, 12, 20\}$$