

**A.A.31: Set Theory 1: Find the intersection of sets (no more than three sets) and/or union of sets (no more than three sets)**

- 1 Given:  $M = \{\text{green, red, yellow, black}\}$

$$N = \{\text{blue, green, yellow}\}$$

Which set represents  $M \cup N$ ?

- 1)  $\{\text{yellow}\}$
- 2)  $\{\text{green, yellow}\}$
- 3)  $\{\text{blue, red, black}\}$
- 4)  $\{\text{green, red, yellow, blue, black}\}$

- 2 Given:  $A = \{2, 4, 5, 7, 8\}$

$$B = \{3, 5, 8, 9\}$$

What is  $A \cup B$ ?

- 1)  $\{5\}$
- 2)  $\{5, 8\}$
- 3)  $\{2, 3, 4, 7, 9\}$
- 4)  $\{2, 3, 4, 5, 7, 8, 9\}$

- 3 Given:  $A = \{3, 6, 9, 12, 15\}$

$$B = \{2, 4, 6, 8, 10, 12\}$$

What is the union of sets  $A$  and  $B$ ?

- 1)  $\{6\}$
- 2)  $\{6, 12\}$
- 3)  $\{2, 3, 4, 8, 9, 10, 15\}$
- 4)  $\{2, 3, 4, 6, 8, 9, 10, 12, 15\}$

- 4 Given:

$$\text{Set } A = \{(-2, -1), (-1, 0), (1, 8)\}$$

$$\text{Set } B = \{(-3, -4), (-2, -1), (-1, 2), (1, 8)\}$$

What is the intersection of sets  $A$  and  $B$ ?

- 1)  $\{(1, 8)\}$
- 2)  $\{(-2, -1)\}$
- 3)  $\{(-2, -1), (1, 8)\}$
- 4)  $\{(-3, -4), (-2, -1), (-1, 2), (-1, 0), (1, 8)\}$

- 5 Given:  $R = \{1, 2, 3, 4\}$

$$A = \{0, 2, 4, 6\}$$

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

What is  $R \cap P$ ?

- 1)  $\{0, 1, 2, 3, 4, 5, 6, 7\}$
- 2)  $\{1, 2, 3, 4, 5, 7\}$
- 3)  $\{1, 3\}$
- 4)  $\{2, 4\}$

- 6 Given:  $Q = \{0, 2, 4, 6\}$

$$W = \{0, 1, 2, 3\}$$

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

What is the intersection of sets  $Q$ ,  $W$ , and  $Z$ ?

- 1)  $\{2\}$
- 2)  $\{0, 2\}$
- 3)  $\{1, 2, 3\}$
- 4)  $\{0, 1, 2, 3, 4, 6\}$

- 7 Given:  $X = \{1, 2, 3, 4\}$

$$Y = \{2, 3, 4, 5\}$$

$$Z = \{3, 4, 5, 6\}$$

What is the intersection of sets  $X$ ,  $Y$ , and  $Z$ ?

- 1)  $\{3, 4\}$
- 2)  $\{2, 3, 4\}$
- 3)  $\{3, 4, 5\}$
- 4)  $\{1, 2, 3, 4, 5, 6\}$

- 8 Given the following:

$$A = \{\text{Charles, Kyle, Nakim, Jade}\}$$

$$B = \{\text{Charles, Jade, Alicia, Kyle}\}$$

$$C = \{\text{Kyle, Nakim, Jade, Dylan}\}$$

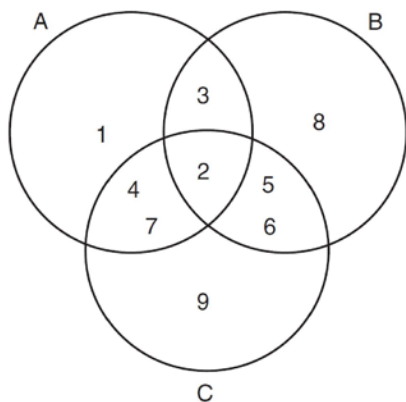
What is the intersection of sets  $A$ ,  $B$ , and  $C$ ?

- 1)  $\{\text{Kyle, Nakim}\}$
- 2)  $\{\text{Charles, Kyle}\}$
- 3)  $\{\text{Jade, Nakim}\}$
- 4)  $\{\text{Jade, Kyle}\}$

- 9 If  $A = \{0, 1, 3, 4, 6, 7\}$ ,  $B = \{0, 2, 3, 5, 6\}$ , and  $C = \{0, 1, 4, 6, 7\}$ , then  $A \cap B \cap C$  is

- 1)  $\{0, 1, 2, 3, 4, 5, 6, 7\}$
- 2)  $\{0, 3, 6\}$
- 3)  $\{0, 6\}$
- 4)  $\{0\}$

- 10 Which set represents the intersection of sets  $A$ ,  $B$ , and  $C$  shown in the diagram below?



- 1)  $\{3, 4, 5, 6, 7\}$
- 2)  $\{2\}$
- 3)  $\{2, 3, 4, 5, 6, 7\}$
- 4)  $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

- 11 Given:  $A = \{1, 3, 5, 7, 9\}$

$$B = \{2, 4, 6, 8, 10\}$$

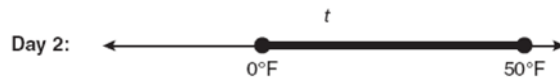
$$C = \{2, 3, 5, 7\}$$

$$D = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

What statement is *false*?

- 1)  $A \cup B \cup C = D$
- 2)  $A \cap B \cap C = \{\}$
- 3)  $A \cup C = \{1, 2, 3, 5, 7\}$
- 4)  $A \cap C = \{3, 5, 7\}$

- 12 Maureen tracks the range of outdoor temperatures over three days. She records the following information.



Express the intersection of the three sets as an inequality in terms of temperature,  $t$ .

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**Answer Section**

- 1 ANS: 4 REF: 061426ia  
 2 ANS: 4 REF: 011225ia  
 3 ANS: 4 REF: 061123ia  
 4 ANS: 3 REF: fall0710ia  
 5 ANS: 3 REF: 061324ia  
 6 ANS: 1 REF: 011004ia  
 7 ANS: 1 REF: 011101ia  
 8 ANS: 4 REF: 081408ia  
 9 ANS: 3 REF: 061208ia  
 10 ANS: 2 REF: 081003ia  
 11 ANS: 3  
 $A \cup C = \{1, 2, 3, 5, 7, 9\}$

REF: 081221ia

- 12 ANS:  
 $0 \leq t \leq 40$

REF: 060833ia