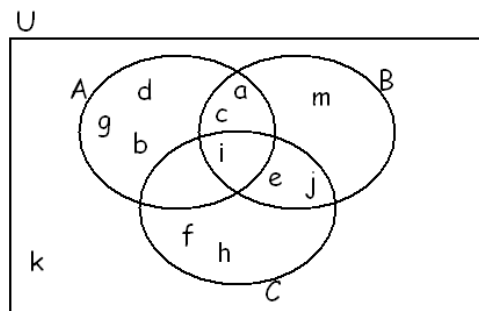


- Let $A = \{2, 3, 5, 6, 8, 9, 10\}$ and $B = \{1, 3, 4, 8, 10\}$. Label the following statements as true or false.
 - $2 \in A$
 - $2 \in B$
 - $3 \in A \cap B$
 - $9 \in A \cup B$
- Let $A = \{2, 3, 5, 6, 8, 9, 10\}$ and $B = \{1, 3, 4, 8, 10\}$.
 - Find $A \cap B$.
 - Find $A \cup B$.

- Consider the picture given. Find each of the following.

- $A \cap B$
- $B \cup C$
- $(A \cup B) \cap C$



- Let A be the set of females in our class today, and B be the set of students in our class today who have a calculator with them.
 - Describe the set $A \cap B$.
 - Describe the set $A \cup B$.
- Let $A = \{1, 2, 3, 4, 5\}$, $B = \{2, 4, 6, 8, 10\}$, and $C = \{2, 3, 5, 7\}$
 - Find $A \cap B$.
 - Find $A \cap C$.
 - Find $(A \cup C) \cap B$.
 - Find $(A \cap C) \cup B$.
- Label each of the following as true or false.
 - $3 \leq 3$
 - $7 < -6$
 - $\mathbb{Z} \subseteq \mathbb{N}$
 - $0 \in \mathbb{N}$
 - $\mathbb{N} \cup \mathbb{Z} = \mathbb{Z}$
 - for all sets A and B , $A \cap B = B \cap A$.
- Simplify each of the following expressions.

- | | | |
|--------------------------|---|---------------------------|
| a) $(12 - 5) + 2$ | e) $24 \div (3 \cdot 2)$ | i) $10 - 2(3^2 - 5)$ |
| b) $12 - (5 + 2)$ | f) $24 \div 3 \cdot 2$ | j) $\sqrt{16} + \sqrt{9}$ |
| c) $12 - 5 + 2$ | g) $5 \cdot 3^2 - (3 + 2 \cdot 5 - 1) \div 2$ | k) $\sqrt{16 + 9}$ |
| d) $(24 \div 3) \cdot 2$ | h) $(10 - 2)(3^2 - 5)$ | |

- Simplify each of the following expressions by applying the order of operations agreement. **Show all steps. Perform only one operation in each step.**

- | | | |
|-------------------------|--|---|
| a) $5 - 2^2$ | g) $\sqrt{-49}$ | l) $7 \cdot 3^2 - (3 + 2 \cdot 5 - 1) \div 2$ |
| b) $15 - 7 + 3$ | h) $\sqrt{25 - 16}$ | m) $\frac{4^2 + 5^2 - 6 \div 2 \cdot 3}{2^4 - 2^3}$ |
| c) $120 \div 6 \cdot 2$ | i) $\sqrt{25} - \sqrt{16}$ | n) $3 + 2(5 + 3(15 - 2^3) - 2^2 - 1)$ |
| d) $8^2 - 3^2$ | j) $2^3 - 2(11 - 3^2)^2$ | o) $4(3(2(2^2 - 1) - 1) - 1) + 5$ |
| e) $(8 - 3)^2$ | k) $\left(\left((8 - 5)^2 - 7\right)^2 - 2\right)^2 - 1$ | |
| f) $-\sqrt{49}$ | | |

- What is the last digit of 5^{2017} ?

- Insert parentheses in the expression on the left-hand side to make the equation true.

$$36 - 2 \cdot 5 - 2^2 + 4 = 10$$

- 11*. A set is infinite if it has infinitely many elements. Find three infinite sets A , B , and C so that the intersection of any two of the three sets is infinite, (i.e. $A \cap B$ is infinite, $A \cap C$ is infinite, and $B \cap C$ is infinite), and the intersection of all three sets is the empty set (i.e. $A \cap B \cap C = \emptyset$).

Answers

1. a) true b) false c) true d) true
2. a) $A \cap B = \{3, 8, 10\}$ b) $A \cup B = \{1, 2, 3, 4, 5, 6, 8, 9, 10\}$
3. a) $A \cap B = \{a, c, i\}$ b) $B \cup C = \{a, c, e, f, h, i, j, m\}$ c) $(A \cup B) \cap C = \{e, i, j\}$
4. a) Female students who have calculators with them.
b) All female students and males students with calculators. (Also correct: All students with calculators and female students without calculators.)
5. a) $A \cap B = \{2, 4\}$ b) $A \cap C = \{2, 3, 5\}$ c) $(A \cup C) \cap B = \{2, 4\}$
d) $(A \cap C) \cup B = \{2, 3, 4, 5, 6, 8, 10\}$
6. a) true b) false c) false d) false e) true f) true
7. a) 9 b) 5 c) 9 d) 16 e) 4 f) 16 g) 39 h) 32 i) 2 j) 7 k) 5
8. a) 1 b) 11 c) 40 d) 55 e) 25 f) -7 g) undefined h) 3 i) 1 j) 0 k) 3 l) 57
m) 4 n) 45 o) 61
9. 5
10. * not tellin' 11.* not tellin'