M230: Finite Mathematics
QUIZ 1
Tuesday, 8:00 – 8:50 A.M.
You must show all your work!!! Closed books, closed notes. No calculator.
Duration: 10 min.

Your Name: 30n
Section Number: 020

1. Use a Venn Diagram to solve the following problem. Let $A$ and $B$ be two sets. Suppose $n(A) = 8$, $n(B) = 13$ and $n(A \cap B) = 3$. Find $n(A \cup B)$. Circle your answer.

![Venn Diagram](image)

$n(A \cup B) = 18$

2. Taking into consideration the empty set and the set itself, list all the subsets of the set \{x, y\}. Write your answer clearly.

\[ \emptyset \quad \{x\} \quad \{y\} \quad \{x, y\} \]

\[ \text{any} \quad 2 = \frac{1}{2} \quad \rho^+ \]

\[ \text{all} \quad \forall y \in \rho^+ \]
1. Use a Venn Diagram to solve the following problem. Let $A$ and $B$ be two sets. Let $U$ be a universal set. Suppose $n(U) = 35$, $n(A) = 8$, $n(B) = 13$ and $n(A \cap B) = 3$. Find $n((A \cup B)')$. Circle your answer.

\[
\begin{array}{c}
A & \cap & B \\
5 & 3 & 10 \\
& & 12 \\
\end{array}
\]

\[n((A \cup B)') = 12\]

2. Find the set $\{(1, 2) \times \{3, 4\}\} - \{(2, 4)\}$. Write your answer clearly.

\[
\{(1, 2) \times \{3, 4\}\} = \{(1, 3), (1, 4), (2, 3), (2, 4)\} = \frac{1}{2} \, \mathbb{R}^+
\]

\[
(\{(1, 2) \times \{3, 4\}\} - \{(2, 4)\}) = \{(1, 3), (1, 4), (2, 3)\} \sim \frac{1}{2} \, \mathbb{R}^+
\]
1. Use a Venn Diagram to solve the following problem. Let $A$ and $B$ be two sets. Suppose $n(A) = 8$, $n(A \cup B) = 18$ and $n(A \cap B) = 3$. Find $n(B)$. Circle your answer.

$$n(B) = 13$$

2. Taking into consideration the empty set and the set itself, list all the subsets of the set \{1, 2\}. Write your answer clearly.

$$\emptyset \quad \text{any } 2 = \frac{1}{2} p^+$$
$$\{1\} \quad \text{all } 1 = 1 p^+$$
$$\{2\}$$
$$\{1, 2\}$$
1. Use a Venn Diagram to solve the following problem. Let $A$ and $B$ be two sets. Suppose $n(A) = 8$, $n(B) = 13$ and $n(A \cup B) = 18$. Find $n(A \cap B)$. Circle your answer.

\[ n(A \cap B) = 3 \]

2. Taking into consideration the empty set and the set itself, list all the subsets of the set \{1, 2, 3\}. Write your answer clearly.

\[ \varnothing \]
\[ \{1\} \]
\[ \{2\} \]
\[ \{3\} \]
\[ \{1, 2\} \]
\[ \{1, 3\} \]
\[ \{2, 3\} \]
\[ \{1, 2, 3\} \]
1. Use a Venn Diagram to solve the following problem. Let $A$ and $B$ be two sets. Let $U$ be a universal set. Suppose $n(U) = 30$, $n(A) = 8$, $n(B) = 13$ and $n(A \cup B) = 18$. Find $n((A \cap B)')$. Circle your answer.

$$n((A \cap B)') = 27$$

$$\frac{1}{2} \rho^+$$

2. Find the set $\{(2,4), (4,7)\} - \{(1,2) \times (2,4)\}$. Write your answer clearly.

$$\mathcal{E}_1, \mathcal{E}_2 \times \mathcal{E}_3, \mathcal{Y}_3 = \{ (1,3), (4,4), (2,3), (2,4) \} \leftarrow \frac{1}{2} \rho^+$$

$$\{ (2,4), (4,7) \} - \{ (1,3) \times \mathcal{E}_3, \mathcal{Y}_3 \} = \{ (4,7) \} \leftarrow \frac{1}{2} \rho^+$$
1. Use a Venn Diagram to solve the following problem. Let \( A \) and \( B \) be two sets. Let \( U \) be a universal set. Suppose \( n(U) = 30 \), \( n(A) = 8 \), \( n(A \cup B) = 18 \) and \( n(A \cap B) = 3 \). Find \( n(B') \). Circle your answer.

\[
\begin{array}{c}
\text{A} \\
\text{3} \\
\text{B} \\
\text{10} \\
\text{12} \\
\end{array}
\]

\( n(B') = 17 \)

2. Find the set \( \{(2,4),(4,2),(2,3)\} \cap \{1,2\} \times \{3,4\} \). Write your answer clearly.

\[
\{1,2,3\} \times \{3,4\} = \{1,3), (1,4), (2,3), (2,4)\} \\
(2,4), (4,2), (2,3) \in \{1,2\} \times \{3,4\} \\
\{1,2,3\} \times \{3,4\} = \{1,3,2\} \leftarrow \checkmark \]