

Practice Exam 1

Name:.....

Make sure to neatly and clearly show all work and mark your answers.

1 (4 pts). 1. Write the following set using set-builder notation $\{1, 3, 5, 7, \dots\}$.

2. List the elements of the following set $\{x : x^2 - 4 = 0\}$.

2 (6 pts). Let $A = \{1, 2, 4, 5, 7\}$, $B = \{2, 5, 6, 7, 8\}$, $C = \{1, 5, 7, 8\}$. and $U = \{x \in \mathbb{N} : x \leq 10\}$. Then draw a venn-diagram for A, B and C putting each of the elements of U in the appropriate region of the venn-diagram.

3 (15 pts). Let $A = \{a, b, c\}$ and $B = \{b, c, d\}$. Then find

1. $A \cap B$

2. $(A - B) \times B$

3. $\mathcal{P}(A)$

4. $\mathcal{P}(A - B) \times \mathcal{P}(B - A)$.

5. What is $|\mathcal{P}(A) \times B|$.

4 (15). Let P and Q be the logical statements given by $P = p \vee (q \rightarrow r)$ and $Q = (p \vee q) \wedge r$. Then use a truth table to determine if P implies Q , Q implies P , $P \equiv Q$ or none of the above are true.

5 (10). Write the following statement using symbolic logic. Then give the negation of the statement symbolically. Finally, give this negation as a sentence.

Statement 1. *Everyone who is sane can do logic. None of your sons can do logic. (Lewis Carroll).*

1. Write symbolically
2. Write the symbolic negation.
3. Write the negation as a sentence.