

Name: _____ Date: _____

Quiz 3 Key Median 8.5/10

1) Use either list notation or set builder notation to express the given sets

The set of elements 2, 4, 6	$\{2, 4, 6\}$
The set consisting of the elements $\{1\}$, $\{4\}$.	$\{\{1\}, \{4\}\}$
The set of real solutions to the equation $x^3 - 4x^2 + 5x - 6 = 0$;	$\{x : x \in \mathbb{R} \text{ and } x^3 - 4x^2 + 5x - 6 = 0\}$
The set of integers less than -10.	$\{n : n \in \mathbb{Z} \text{ and } n < -10\}$

2) Express the given sets in interval notation

The set of real numbers x such that $x > 1$.	$(1, \infty)$
The set of real numbers x such that $-1 < x$ and $1 > x$.	$(-1, 1)$

3) List which of the relations by inserting the symbol for "element of," "proper subset of," "subset," or "equals" can be used to replace the symbol \diamond .

Relation	Symbol(s) that can be used to replace the symbol \diamond .
$\{1\} \diamond \{1, 2\}$	\subset, \subseteq
$\{6, 7, 8\} \diamond \{8, 7, 6\}$	$\subseteq, =$
$\{3\} \diamond \{3, \{3\}, \{\{3\}\}$	\in, \subset, \subseteq

4) Determine whether or not the set is finite/infinite and list the cardinality for any finite sets.

Set	Infinite or Cardinality
$C = [5, 6]$	Infinite
$E = \{n : n \in \mathbb{N} \text{ and } n \leq 8\}$	$ E = 9$
$G = \{\emptyset, \{\emptyset\}\}$	$ G = 2$

5) Determine a simplified circuit for $S = (p \wedge q) \vee \neg q$. Show your work.

$S =$

$\neg q \vee (q \wedge p)$ by associative law

$(\neg q \vee q) \wedge (\neg q \vee p)$ by distributive law

$t \wedge (\neg q \vee p)$ by negation law

$\neg q \vee p$ by identity law