

Sec. 3.5 Working With Sets

Vocabulary

roster form: lists the elements of a set within braces $\{ \}$

ex: $1, 2 \rightarrow \{1, 2\}$

even numbers $\{2, 4, 6, 8, \dots\}$

set-builder notation: describes the properties an element must have to be included in a set.

ex: even numbers: $\{x \mid x \text{ is a multiple of } 2\}$

"the set of all real numbers x such that x is a multiple of 2"

ex: $y \geq 7 \quad \{y \mid y \geq 7\}$

empty set: null set: the set that contains no elements.

- The empty set is a subset of every set
- \emptyset or $\{ \}$

universal set: universe; largest set you are using

Complement of a set: the set of all elements in the universal set that are NOT in the set. The complement of set A is A' .

$$A \subseteq U \quad A' \subseteq U$$

subset: A is a subset of a set B if each element of A is also an element of B . $A \subseteq B$

$$U = \{-2, -1, 0, 1, 2, 3\}$$

$$A \subseteq U \quad A = \{1, 2, 3\}$$

$$A' = \{-2, -1, 0\}$$

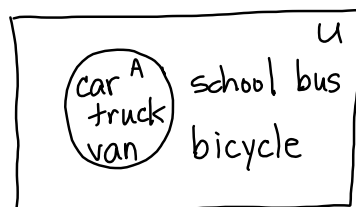
Problem 1: How do you write
 "M is the set of whole numbers
 that are less than 5"
 in roster form? $M = \{0, 1, 2, 3, 4\}$
 in set-builder notation?
 $M = \{x \mid x \text{ is a whole number less than } 5\}$

Problem 2: In set-builder notation, how
 do you write the solutions of

$$\begin{array}{r} -4x + 3 < 15 \\ \underline{-3 \quad -3} \\ -4x < 12 \\ \underline{-4 \quad -4} \\ x > -3 \end{array} \quad \{x \mid x > -3\}$$

Problem 3: What are all the subsets
 of the set $\{1, 2, 3\}$?
 $\{\}, \{1\}, \{2\}, \{3\}, \{1, 2\}, \{1, 3\},$
 $\{2, 3\}, \{1, 2, 3\}$

Problem 4: Given that the universal set
 $U = \{\text{car}, \text{truck}, \text{van}, \text{school bus}, \text{bicycle}\}$
 and that A is the set of vehicles that
 have 4 wheels, what is the complement
 of set A?



$$A^c = \{\text{school bus}, \text{bicycle}\}$$

$\sim A$