Math 102 - Fall 2013 - Quiz #2 **Score:** _____ out of 10.

Name: Key

Show all work clearly and in order.

1. Represent the set $S = \{a, b, c, d, e\}$ using set-builder notation.

$S = \{ x \mid x \text{ is one of the first five letters of the English alphabet} \}$

For questions 2-10: Let $A = \{1, 5, 6\}$, $B = \{1, 3, 6\}$ and $\mathcal{U} = \{1, 2, 3, 4, 5, 6, 7\}$

2. Show that A and B are equivalent by giving a one-to-one correspondence between A and B.

$A = \{1, 5, 6\}$
$\updownarrow \quad \updownarrow \quad \updownarrow$
$B = \{1, 3, 6\}$

Hence, $A \sim B$.

(N.B. there are many solutions) how many?

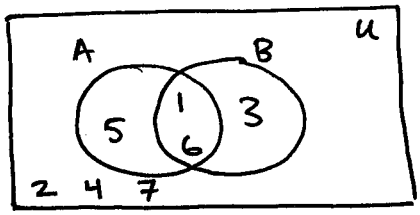
3. List all of the subsets of A.

$\emptyset$
$\{1\}$
$\{5\}$
$\{6\}$
$\{1, 5\}$
$\{1, 6\}$
$\{5, 6\}$
$\{1, 5, 6\} = A$

4. Which subset(s) from your answer to question 3 are **not** proper subsets?

$\{1, 5, 6\}$

5. Draw a Venn diagram showing the relationship between A, B and $\mathcal{U}$.



6. $A \cap B =$ $\{1, 6\}$

7. $A \cup B =$ $\{1, 3, 5, 6\}$

8. $\overline{A} =$ $\{2, 3, 4, 7\}$

9. $\overline{A} \cap (A \cup B) =$ $\{3\}$ (just intersect your answers from 7 and 8)

10. $\overline{\overline{A} \cap B} =$ $\overline{\underbrace{\{2, 3, 4, 7\}}_{\overline{A}} \cap \underbrace{\{1, 3, 6\}}_{B}} = \overline{\{3\}} = \{1, 2, 4, 5, 6, 7\}$