

# Math 112 - Quiz 2

September 1, 2016

Name key Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

1. (2 points) Let  $U = \{3, 6, 9, 12, 15, 18, 21\}$  and let  $A = \{3, 12, 21\}$ . Determine  $n(A')$ .

$$A' = \{6, 9, 15, 18\} \Rightarrow \boxed{n(A') = 4}$$

2. (5 points) Let  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ ,  $X = \{1, 9\}$ , and  $Y = \{1, 2, 3, 4, 5, 6, 7, 8\}$ . Determine whether each statement is true or false.

(a)  $X \subseteq Y$

FALSE,  $9 \notin Y$

(b)  $9 \in Y'$

TRUE, IN FACT  $Y' = \{9\}$

(c)  $\emptyset \subseteq X$

TRUE,  $\emptyset$  IS A SUBSET OF EVERY SET

(d)  $5 \subseteq Y$

FALSE,  $5 \in Y$  NOT A SUBSET OF  $Y$

(e)  $X$  has four subsets.

TRUE,  $\emptyset, \{1\}, \{9\}, \{1, 9\}$

3. (2 points) Let  $B$  be the set of letters of the word *penicillin*. Give an example of a set that is equivalent to  $B$ , but not equal to  $B$ .

$$B = \{p, e, n, i, c, l, l, n\}$$

LET  $A = \{1, 2, 3, 4, 5, 6\}$

$$A \cong B \text{ BUT } A \neq B$$

4. (1 point) For any universal set  $U$ , what set is its complement  $U'$ ?

$$U' = \emptyset$$