MATH 1200 (SECTION E):TEST 1 OCTOBER 25,
DURATION: 75 MINUTES

Full Name:
Student number:

1. Let $A = \{1, \{2\}, 3\}$ and $B = \{1, 2\}$. Which of the following are true or false. Justify your answer.
(a) $B \subseteq A$.
(b) $\{2\} \in B$.
(c) $\{1, \{2\}\} \subseteq A$.

2. Disprove the following statements.
(a) If $a > b$, then $3a$ is necessarily $> 2b$.
(b) The set of all x which satisfy the inequality $|x^2 - 4| > 4$ is all x such that $|x| > 3$.
(c) If $n^2 - 6n + 8 = 0$, then $n = 4$.

3. Let n be an integer. Then n is even if and only if n^2 is even.

4. Let n be an integer. If $3n^2 + 4n + 5$ is even, then n is odd.

5. Prove the following statement by contrapositive.
   Let m and n be integers. If mn is even, then m or n is even.