Reminders:

- Remember to review the instructions for Problem Sets before turning in work.
- **Individual** problems (second section below) that are marked with a star ($\star$) may be included in your Proof Portfolio.

1 Team Problems

1. Let a, b, and c be integers such that $a + b = a + c$. Using only the Axioms, theorems, and results of Activities found in Investigation 1, prove that $b = c$.
2. Choose EXACTLY ONE of the following two. Don't turn in both!
   (a) Prove that the sum of any three consecutive whole numbers is divisible by 3. (Hint: Let n be the smallest of three consecutive whole numbers. How could you express the other two in terms of n?)
   (b) Suppose x is a four-digit whole number, and the sum of its digits is divisible by 3. Prove that x itself is divisible by 3. (Example: 4839. The sum of digits is $4 + 8 + 3 + 9 = 24$ which is divisible by 3; and 4389 itself is divisible by 3.) Please note you are ***only*** dealing with 4-digit numbers here; you do not need a proof for any other size number. Also, hint: If the digits of the number are d_3, d_2, d_1, and d_0 then the number itself can be written using "base 10" notation as $1000d_3 + 100d_2 + 10d_1 + d_0$. (Example: With 4389, use $d_3 = 4$, $d_2 = 3$, $d_1 = 8$, $d_0 = 9$.)

2 Individual Problems

1. Let a and b be integers. Using only the Axioms, theorems, and results of Activities found in Investigation 1, prove that if $a \leq b$ and $b \leq a$, then $a = b$.
2. ($\star$) Let x be an integer such that $x \neq 0$. Using only the Axioms, theorems, and results of Activities found in Investigation 1, prove that $x^2 > 0$.