Name: _____

Directions: Solve the following problems. Give supporting work/justification where appropriate.

1. **[2 parts, 3 points each]** Prove or disprove the following.

   (a) Suppose that $a, b \in \mathbb{Z}$. If $a \mid b$ and $b \mid a$, then $a = b$.

   (b) If $n \in \mathbb{N}$, then $n^3 + 8$ is not prime.

2. **[4 points]** Prove that if $n \in \mathbb{N}$, then $\displaystyle\sum_{k=1}^{n} k(k+1) = \frac{n(n+1)(n+2)}{3}$.