

Name: \_\_\_\_\_

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1. Show that for any positive integer  $n$ ,  $\sum_{i=0}^n x^i = \frac{1-x^{n+1}}{1-x}$ .

**Solution:**

2. Let  $A_1, \dots, A_n$ , and  $B$  be some sets. Show that  $\cup_{i=1}^n (A_i \cap B) = (\cup_{i=1}^n A_i) \cap B$ .

**Solution:**

3. Show that  $\sum_{i=1}^n \frac{1}{i(i+1)} = \frac{n}{n+1}$ .

**Solution:**