

MA 261 — Quiz #2
Wednesday, February 7, 2014

Choose one of the following two problems:

- 1.** Prove by induction that the following formula is true for all natural numbers $n \geq 1$:

$$\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \cdots + \frac{1}{n(n+1)} = 1 - \frac{1}{n+1}.$$

- 2.** Assume $x \neq 1$. Prove by induction that the following formula is true for any integer $n \geq 0$:

$$x^0 + x^1 + x^2 + \cdots + x^n = \frac{x^{n+1} - 1}{x - 1}.$$