Quiz 3   MAD 2104   Summer A 2011

This is a take-home quiz. The due date is Tuesday, May 31. For full credit, you must show all your work.

1. (10 pts) Consider the function $f : \mathbf{Z} \to \mathbf{Z}$, defined by $f(n) = \lfloor \frac{n}{3} \rfloor$. Is this function one-to-one? Is this function onto? Justify your answers.

2. (10 pts) Find, with proof, a formula for $\displaystyle\sum_{k=2}^{n} \frac{1}{k^2 - 1}$.

Hint: Find an identity that expresses $\frac{1}{k^2-1}$ in terms of $\frac{1}{k-1}$ and $\frac{1}{k+1}$ and use the "telescopic sum" method described in Exercises 19, 20, p. 165.