# Group Quiz, January 21, 2014

Let $\mathbb{N}$ denote the set of positive integers.

1. If $d(m,n) = \left|\frac{1}{m} - \frac{1}{n}\right|$, is $d$ a metric on $\mathbb{N}$? Explain.
2. Does there exist a metric on $\mathbb{N}$ for which the set $\{1,2,4\}$ is a neighborhood of the element 2? Explain.
3. Does there exist a metric on $\mathbb{N}$ for which the set of even positive integers is an open set? Explain.
4. Does there exist a metric on $\mathbb{N}$ for which the singleton set $\{2\}$ is *not* a closed set? Explain.