1. Why are metric spaces not so often used in numerical analysis? Why are eg. inner product spaces much more common?

2. If $x$ is an exact quantity and $\tilde{x}$ is an approximation to $x$, what is the error; $e = x - \tilde{x}$, or $e = \tilde{x} - x$? Does it matter? How does this sign convention define the term ‘residual’?

3. We attempt to build a normed space out of a metric space as follows. Take any metric space $(X, d)$ and define $\|x\| := d(x, 0)$. -Are there any problems with this attempt or do we obtain a normed space?

4. On a conference you meet a mathematician M. M says: “...have not understood the topology of this space...”. Seriously, what is actually meant by this? Does it have anything to do with topological spaces or is it just buzz?

5. An iterative procedure for solving $F(x) = y$ produces a sequence $(x_n)_{n \geq 1}$. Suppose both the domain and the range of $F$ can be turned into suitable metric spaces $(D, d_d)$ and $(R, d_F)$. When should the iteration stop? When $d_x(x_n, x_{n+1}) \leq TOL$ or when $d_F(F(x_n), y) \leq TOL$? Or is there some kind of clever combination?