MS 2001 Team Tutorial Quiz 1

October 3, 2011

The teams are as follows. You will be together every week that there is a 'quiz'. Feel free to name your team something else (that I can put on the webpage so nothing dodge.) You are on **Team X** if:

Team 1 your surname begins with C.

Team 2 your surname begins with B, F, H, or O'B.

Team 3 your surname begins with D or O'D.

Team 4 your surname begins with L or O'L.

Team 5 your surname begins with K or M.

Team 6 your surname begins with Q, R, O'R, O'G or anything else not covered here.

Team 7 your surname begins with S, W or is O'Connor.

Questions:

1. Define a map $f : [0, \infty) \to \mathbb{R}$ by $f(x) = \pm\sqrt{x}$. Is f a function? Give reasons for your answer.
2. Give a proof by contradiction that $\sqrt{3} \notin \mathbb{Q}$.
3. Solve $x = x \sin x$ for $0 \leq x \leq 2\pi$.
4. Prove that $s(x) = x^2$ is strictly increasing on $(0, \infty)$.
5. Prove that $l(x) = mx + c$ is a line of slope m.
6. Solve $x^3 + 6x^2 - 9x - 14 = 0$.
7. Prove that $|-x| = |x|$.
8. Find an upper bound for $|c(x)|$ on $[0, 1]$ where $c(x) = ax^3 + bx^2 + cx + d$ with a, b, c, $d \in \mathbb{R}$, $a \neq 0$.

Write down your solutions and your team name on some paper and have it ready to hand up — then we can keep score and maybe even have prizes.