Closing Ceremony Speech at MathPath 2015
Mr M (Prof Stephen B Maurer), Executive Director
July 25, 2015

Parents and Students,

At the opening ceremony, I told the students what I hoped they would experience at MathPath. They did experience it. Let me review that.

MathPath was the first national camp exclusively about mathematics and exclusively for middle-school aged students. It was founded by George Thomas, after he had already founded a high school age math camp and before he founded Epsilon camp for even younger students and Delta camp for even younger^2 students.

Now there are competing camps – other national camps exclusively for math that accept middle-school age kids. But MathPath remains unique, not just because it only accepts middle school aged kids, but also because of the variety of mathematics and the amount of fun.

Some of you are very interested in math competitions. That's a good way to get hooked into mathematics, and the competing camps that accept middle school age kids emphasize competition preparation. But professional mathematicians don't do competitions. To be sure, they can get prizes for research, and sometimes for teaching and for writing mathematics, but it's not competition in the same sense. So bringing you into the real world of mathematics must take you beyond competitions.

We do have competition practice here. This year Ms O'Neill gave MATHCOUNTS and AMC courses, and Mr Kanbir gave an AIME and an Olympiad course. But MathPath does much more, and with the slowly declining interest in contest courses here, it seems that more and more of you come here already knowing that it's the much more you want.

We have foundation courses – courses on basic mathematical concepts that aren't much emphasized in the North American school curriculum, such as number theory and induction. We have more advanced special topics courses, such as Dr V's *The Other* [pause – students shouted the rest of the name] Triangular Numbers or Prof Perkinson's [pause] *Abelian Sandpile Models* (I am sure parents of students who took that will want to know what that is). We have, courses on 4 different geometries: for 5 bonus points each in Quiz Bowl name the courses [a student from the audience correctly answered all 4] Analytic, Hyperbolic, Elliptic and Projective. And we have plenaries where you see active mathematicians at work, for instance, John Conway explaining his discovery (or was it invention?) of the surreal numbers. We even had a teacher, Prof Klyve, who in his *Finite Morse Theory* led his class to discover and prove a new theorem! And, I am pleased to say, you have learned how to listen to advanced talks that are hard for you to follow and still get something out of them. You are coming to understand that mathematicians do not know everything but rather know how much they don't know and are struggling to understand.

Add to that our month long courses on history of mathematics and on writing mathematics and you get a very broad view of the mathematical enterprise.

And that is not all. Let me mention the Problems of the Day, run this year once again in the first week by Mr L, and then taken over by Kip and Philip, with Philip continuing to provide his now famous real time illustrations. These are thinking out of the box problems. They are only sometimes solved by traditional mathematical techniques; they usually need some sort of clever special idea. But many problems in life as well as mathematics need clever special ideas, so practice in looking for them is very valuable – as well as great fun.

So that's an overview of what we *do* in the official academic program of the camp. Before I go on to the unofficial part, I want to say something about the sense of *community* in the academic part. Let me begin with a statement a student made several years ago on one of our student surveys. He or she wrote: This is the first time I have felt

mediocre. Along the same lines, a counselor last year reported to me that some older campers were saying, these young little kids are so smart, what am I doing here?

I want to turn these feelings of mediocrity around. While the *density* of math-smart people in the world is low, in *absolute numbers* we are actually quite large. What this MathPathers were saying was: before now I noticed only the density and felt special; at MathPath I suddenly saw the absolute numbers.

But these absolute numbers are a good thing. There is a vibrant worldwide community of math people; together we accomplish a lot and there is a place for us all, the really smart and the really really smart. At MathPath you began to see the collaborative nature of that community. In all my classes and plenaries there were many students who made good contributions. There were many winners for the Problems of the Day and the various other contests. In most classwork at MathPath you were encouraged to work together and there were no grades. We are all in this together, and together we should feel proud and accomplished, not mediocre.

So let me go on to the unofficial part of the program. The key aspect is how you students interact with each other. Sometimes you talk math, sometimes you show each other how to solve puzzles, often you just kid around. But as someone said in the 2008 EndCamp Survey, this is a camp where it is ok to be a geeky math kid because there are lots of geeky math kids. As a result, you do all sorts of things that geeky kids like to do.

Among these are all the games and tournaments – chess, Set, other card games, Debate, but also pool, table tennis, football with a round ball, tennis and pickleball. And then there are the great trips – indoor rock climbing, Powell's bookstore, bowling, Canon Beach, to name just a few.

Throughout, you have a great sense of humor. You had to have a great sense of humor to wear some of the costumes you wore, or made your

counselors wear, during Spirit Week. The point is, through your geeky natures bouncing off each other, you create a unique spirit and have a lot of fun.

You've made a lot of new friends, from around the country and the world. And today, with email, instant messaging, cell phones, Skype, and online MathPath forums at Facebook and the Art of Problem Solving, you can easily keep up with these friends until you see them again – at this camp next year, or other camps, at national competitions, at college, or later in life.

So keep thinking back on what happened here. A few years from now, even things that that didn't seem so important here may stand out in ways you can't foresee.

I've enjoyed being here with you. Well, let me explain that, because for the first time being at MathPath has actually been rather a struggle for me. Becoming Executive Director last fall has meant even more work behind the scenes than before as Academic Director. And medical conditions, both permanent and temporary, have slowed me down considerably. The result is that I have had no free time to spend with you. My interactions with you have been confined to classes, plenaries, conferencing, and an occasional meal. I miss leading bike trips, or teaching you racquetball or squash. There are many of you I have not talked to once, unlike in past years. I am not happy about this. But still, I have been watching *all of you* have fun and learn and that gives me great pride. Thank you for making this a great camp. I look forward to seeing you again, or learning of your accomplishments in the years ahead. Thank you.