# Mathematics Exams - Upper School

## *What to expect*

[1] If you can efficiently and flawlessly work problems like those assigned that were of a routine nature, expect a grade of B.

[2] If you accomplish [1] and demonstrate understanding of the ideas involved, expect a grade of A.

Exam problems that test [1] require you to use the techniques and procedures nearly automaticly. Examples of such problems include "solve for the unknown", "find all solutions to", "what is the domain of $f$", "where does $f$ take its maximum/minimum values," or "state the definition of a the function".

Exam problems that test [2] will often appear to be *unlike* those you have seen before and may include proofs. The required understanding can be acquired by thoughtfully doing assigned problems and joining the class discussions that explore the ideas that underlie technical skill. While many assigned problems are routine, some problems, for example proofs, emphasize ideas; such problems, perhaps slightly changed, may appear on the exam.

The problems on the IB exam that you will take to obtain the IB diploma are more like those of [2] than those of [1]. Many of the problems in the series of Japanese mathematics books that we use at MCDS are excellent practice for the IB exam.

Mathematics exams will have a time limit such that you will have to be proficient at using the techniques taught and applying the ideas taught or else you will not finish.

## *How to prepare*

[1] Learning mathematics *nearly always* involves working on paper. If you believe that exam preparation consists of reading the book and your notes without working along with them or consists of looking at problems thinking to yourself "Yup, I can do that one", then you are mistaken.

[2] Working and reworking the assigned problems and the examples from your book and notes is excellent preparation, providing you (1) ask yourself how the problems and examples use and illustrate the ideas presented and explored in the book and class, and (2) check your answers against those provided. Typically, students get more out of reworking problems than working fresh problems.

[3] If you have kept up with assignments and class, you have already done most of the preparation. If you have not kept up, extra time and effort over as many days as possible will help you much more than trying to "cram" a day or two before the exam. You will not learn mathematics by cramming and your grade will show that.

[4] Remember that in mathematics just as in sports and music, *you play like you practice*.