Invitation to Mathematics Challenge for Young Australians

Dear Student & Parents,

This year William Carey is offering a series of challenging enrichment courses for our top mathematicians. This course is designed and managed by the Australian Mathematics Trust (AMT) which is the key organisation that runs mathematics competitions (Olympiads) in the country. The Mathematics Challenge for Young Australians is targeted towards students who have demonstrated a talent in mathematics and would like to develop this further.

The challenge lasts for 16 weeks between April and September. The program focuses on teaching additional mathematics not traditionally taught at high school and students are encouraged to develop their ability to prove results not just get the correct answer. The program is very challenging and students should not expect to easily master the skills involved.

The challenge can be taken at different levels. Students should reflect on their mathematical ability and experience when choosing which level to attempt. You can find a detailed description of each of the levels on the back of the permission letter. The school recommends students follow the pattern below, though students should consider attempting a lower level program if they have not attempted any of the previous programs.

Year 7	Dirichlet
Year 8	Euler
Year 9	Gauss*
Year 10	Noether*

*Students are expected to have completed the prior program before enrolling in this one.

As part of this program each student would be expected to spend roughly 30 minutes to one hour each week working through the provided resources and attempting the challenge problem for each chapter. Your Maths teacher will be available throughout the year to assist you. **Mrs Ross will also be available assist you every Thursday week B at lunch**.

Students will be provided with study material to work through independently. Each chapter contains detailed examples and explanations of new mathematical 'tools' and some exercises to test themselves. Following each chapter students will be set some problems and given a short period of time (e.g. a fortnight) to find and write up a solution for the problems. Many of the exercises require a non-standard use of the tools while some simply reinforce a concept which has been introduced. Use of mathematical notation and language is encouraged. At the same time, persistence is often required to solve the problems and is a quality to be fostered in all young problem-solvers. Parents are asked to encourage persistence with these challenges as they are quite difficult at times, but the satisfaction in solving them is very rewarding.

This program is not a competition, though students will receive marks and once completed students will be told how they compared to others in the country completing the program. Students are awarded for doing well and not for coming first or above any rank. This enrichment program is linked to several Australia wide mathematical competitions (including the AMC which all our top students sit each year and mathematics Olympiads). If you are interested in competing at a top level in mathematics please contact Miss Smith who can give you more information.

We are very excited to invite you into this program and look forward to supporting you through the challenges. More information about the Australian Mathematics Trust and this program can be found at: http://www.amt.edu.au/wp-content/uploads/Enrichment-information-2016.pdf . As the program is externally managed there is a (non-refundable) entry fee of $42. This covers the cost of producing the student booklet that each student receives.

After carefully considering this letter could you please complete and return the slip below indicating your acceptance (with payment) or rejection of this invitation to the uniform shop. **Students MUST get their classroom teacher's approval and signature before payment**. Please return this note by the **10th of March**. We hope to provide students with booklets before the end of term so they can get a head start (if they wish) over the holidays and begin formally in week one of term two.

Students who successfully complete the program will have their diligence and achievement recognised in their yearly reports. An extra subject will be included in their reports including their overall mark in the program they completed and a comment about their work.

Kind Regards,

Miss C Smith
Advanced Learning Coordinator

Mr G Thackeray
Head Teacher of Mathematics

Invitation for the Mathematics Challenge for Young Australians

Parents: Please indicate your acceptance or rejection of this invitation and return this slip to the uniform shop by the 10th of March.

- ☐ I have read the attached information sheet and **DO NOT** wish for my son/daughter to participate in this program

- ☐ I have read the attached information sheet and wish to support my son/daughter's acceptance for entry into this program.

- I understand that completing this program may lead to an additional subject being included in the yearly report.
- I understand that the entry fee of $42 is not refundable once student's booklets have arrived.

Parent/guardian name: _____ signature: _____

Students: Please indicate your acceptance of this invitation by signing the below contract.

- I have read the attached information sheet and wish to participate in this program.
- I have carefully considered the expectations of this program and will endeavour to uphold all of them.
- I have discussed this program with my mathematics teacher and they support my decision to join this program

Please indicate which program you would like to complete:

- ☐ Newton
- ☐ Dirichlet
- ☐ Euler
- ☐ Gauss
- ☐ Noether

Student name: _____ signature: _____

Mathematics teacher: Please consider the difficulty of this program and the student's demonstrated ability in mathematics and assist them to make a wise decision about entering this challenge and selection of program. Please sign to indicate you support the student's plans completed above.

Teacher: _____ signature: _____

Enrichment Stage

The Enrichment Stage is a six-month enrichment program which commences in April. It comprises (2004) six parallel series of comprehensive student and teacher support notes. Each student participates in one series. These programs are designed for students in upper primary and lower to middle secondary (Years 5 to 10).

The materials for all series are designed to be a systematic structured course over the duration of the program, and which students are intended to keep for on-going reference. (The support of the Australian Government enables this program to be offered to Australian students at an entry fee lower than the cost of buying the notes independently.) This enables schools to time-table the program to fit their school year.

The Newton Enrichment Series

This Series comprises a number of introductory topics in geometry, counting and numbers. It is suitable for students in Years 5 and 6.

The Dirichlet Enrichment Series

This Series contains mathematics concerned with tessellations, patterns, arithmetic in other bases and recurring decimals. It is suitable for students in years 6 or 7.

The Euler Enrichment Series

This Series comprises elementary number theory, geometry, pigeonhole principle, elementary counting techniques and miscellaneous challenge problems, mainly for Year 8 and outstanding Year 7 students.

The Gauss Enrichment Series

This Series comprises elementary geometry, similarity, Pythagoras' Theorem, elementary number theory, counting techniques and miscellaneous challenge problems, mainly for Year 9 students and those who have already done the Euler Series.

The Noether Enrichment Series

This Series consists of material on problem solving, algebra and number theory. It is designed for students in the top 5 to 10 per cent of Year 9 who have taken the Gauss series in another year, and are not yet ready for the Polya series.

The Polya Enrichment Series

This Series consists of notes on deductive reasoning (Euclidean geometry) and algebra. It was designed specifically for the top 5 per cent of Year 10 students and outstanding students in lower years. Schools have found that this series gives a sound base for students who wish to specialise in Years 11 and 12 mathematics.

http://www.amt.edu.au/mcya.html