

Polynomials (E3MAT001C)

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| Introduction | Polynomials play a central role in elementary algebra. The history of mathematics was filled with a wealth of stories that are related to solving polynomial equations. The development of the theory of polynomials had led to developments not only within the scope of algebra but also many other topics in mathematics such as geometry and analysis. In this programme we shall study some basics of polynomials such as basic manipulations of polynomials (expansion, factorisation, division, etc.), solving polynomial equations, and handling rational functions (ratios of two polynomials). |
| Programme Type / Level | Algebra Course (Level III) (Token-required) |
| Instructor(s) | Dr Law Ka Ho Lecturer, Department of Mathematics, The University of Hong Kong |
| Pre-requisites | Students should have the basic knowledge in 1. simple manipulation of algebraic expressions; 2. the distinction between equations and identities. |
| Target Participants | <p>➤ S1 – S6 HKAGE student members</p> <p>➤ Class size: 30</p> <p>All applicants MUST attend the Aptitude Test held on 15 May 2021 except for those who have attended the Aptitude Test held on 21 Nov 2020 or 20 Feb 2021</p> <p>Remarks:</p> <ol style="list-style-type: none"> 1. Due to the limited seats in computer rooms, students who have attended the Aptitude Test on 20 Feb 2021 would not be allowed to take the test on 15 May 2021. Their results on 20 Feb 2021 will be used for this programme. 2. Students will be selected randomly in attending the Aptitude Test if the application is over-subscribed. Only selected students could join the Aptitude Test held on 15 May 2021. 3. A notification email will be sent on 5 May 2021 for the application result of the Aptitude Test. 4. All unselected students will be regarded as their application of this programme unsuccessful. |
| Medium of Instruction | English with English handouts |
| Certificate | <p>E-Certificate will be awarded to participants who have:</p> <ul style="list-style-type: none"> ❖ Attended at least 3 sessions AND ❖ Satisfactory performance in the end-of-course test |
| Intended Learning Outcomes | <p>Upon completion of the programme, participants should be able to:</p> <ol style="list-style-type: none"> 1. recognise basic algebraic identities; 2. apply the remainder and factor theorems in factorising polynomials and solving equations; 3. describe the relationship between roots and coefficients in polynomial equations; 4. understand the importance of polynomials in calculus, analysis and combinatorics. |

Aptitude Test

Students who wish to apply for this programme must take a general aptitude test on **15 May 2021 (1:45 p.m. – 3:45 p.m. or 4:00 p.m. – 6:00 p.m.)**.

This general aptitude test consists of 100 multiple choice questions which covers a wide range of topics in mathematics. The purpose of the test is to figure out the applicant's knowledge in different fields of mathematics in order to choose the most suitable students for different programmes. Neither under-qualified nor over-qualified students will be admitted.

The next aptitude test is scheduled on **21 Aug 2021**. The result of an aptitude test will be valid for one year. If a student takes the test more than once, the latest result will prevail. The following table lists the programmes for which the results of this general aptitude test will apply

| Programme Date | Code | Programme Name | Aptitude test valid | | |
|----------------|-----------|---|---------------------|-------------|-------------|
| | | | 21 Nov 2020 | 20 Feb 2021 | 15 May 2021 |
| Jul 2021 | E1IMO001C | Maths Ignition – Combinatorics | √ | √ | √ |
| Aug 2021 | E1IMO002C | Maths Ignition - Geometry | √ | √ | √ |
| Aug 2021 | E3MAT001C | Polynomials | √ | √ | √ |
| Sep 2021 | E1IMO003C | Maths Ignition - Number Theory | √ | √ | √ |
| Nov 2021 | E1IMO004C | Maths Ignition - Algebra | √ | √ | √ |
| Feb 2022 | E1IMO005C | Maths Ignition - Coordinate Geometry | | √ | √ |
| Mar 2022 | E1IMO007C | CGMO Training 2022 (Phase I) | | | √ |
| Mar 2022 | E1IMO008C | Introduction to Olympiad Mathematics 2022 (Phase I) | | | √ |

Remarks:

1. All aptitude tests will only be arranged on the designated dates. No make-up test will be arranged.
2. No Calculator is allowed.
3. Please bring along with your Identification Card e.g. HKID, student ID.
4. Please arrive at the venue 15 minutes prior to the Aptitude Test begins.

If students who have selected to join the aptitude test are absent without any reasons and prior notification provided, it will result in a lower priority in joining the aptitude test next time when they apply.

Application
Deadline

**3 May 2021
12:00 n.n.**

Application Result
Release Date

28 May 2021

If student members withdraw from the programme after the Application Deadline, the token will be deducted.

Schedule

| Session | Date | Time | Venue |
|----------------------|--------------------|---|-------------------------------|
| Aptitude Test | 15 May 2021 | 1:45 p.m. – 3:45 p.m. or 4:00 p.m. – 6:00 p.m. | Welkin Systems Limited |
| 1 | 3 Aug | 9:30 a.m. – 12:30 p.m. | HKAGE Room 204 |
| 2 | 5 Aug | | |
| 3 | 10 Aug | | |
| 4 | 12 Aug | | |

Welkin Systems Limited:

[7/F, Righteous Centre, 585 Nathan Road, Mongkok, Kowloon](#) (Opposite to Sino Centre)

Remarks:

For any assessment to be held in the programme, no make-up will be arranged.

Sample Examples for the Programme

1. A polynomial $f(x)$ leaves a remainder of 2 when divided by $x+1$ and a remainder of 5 when divided by $x+2$. What is the remainder if $f(x)$ is divided by $(x+1)(x+2)$?
2. Solve the equation $2x^3 - x^2 - 7x = 3$.
3. Without solving the equation $2x^3 - x^2 - 7x = 3$, can you find the sum of the squares of the solutions?

Enquiries

For enquiries, please contact Academic Programme Development Division on 3940 0101 after language selection, press "1".