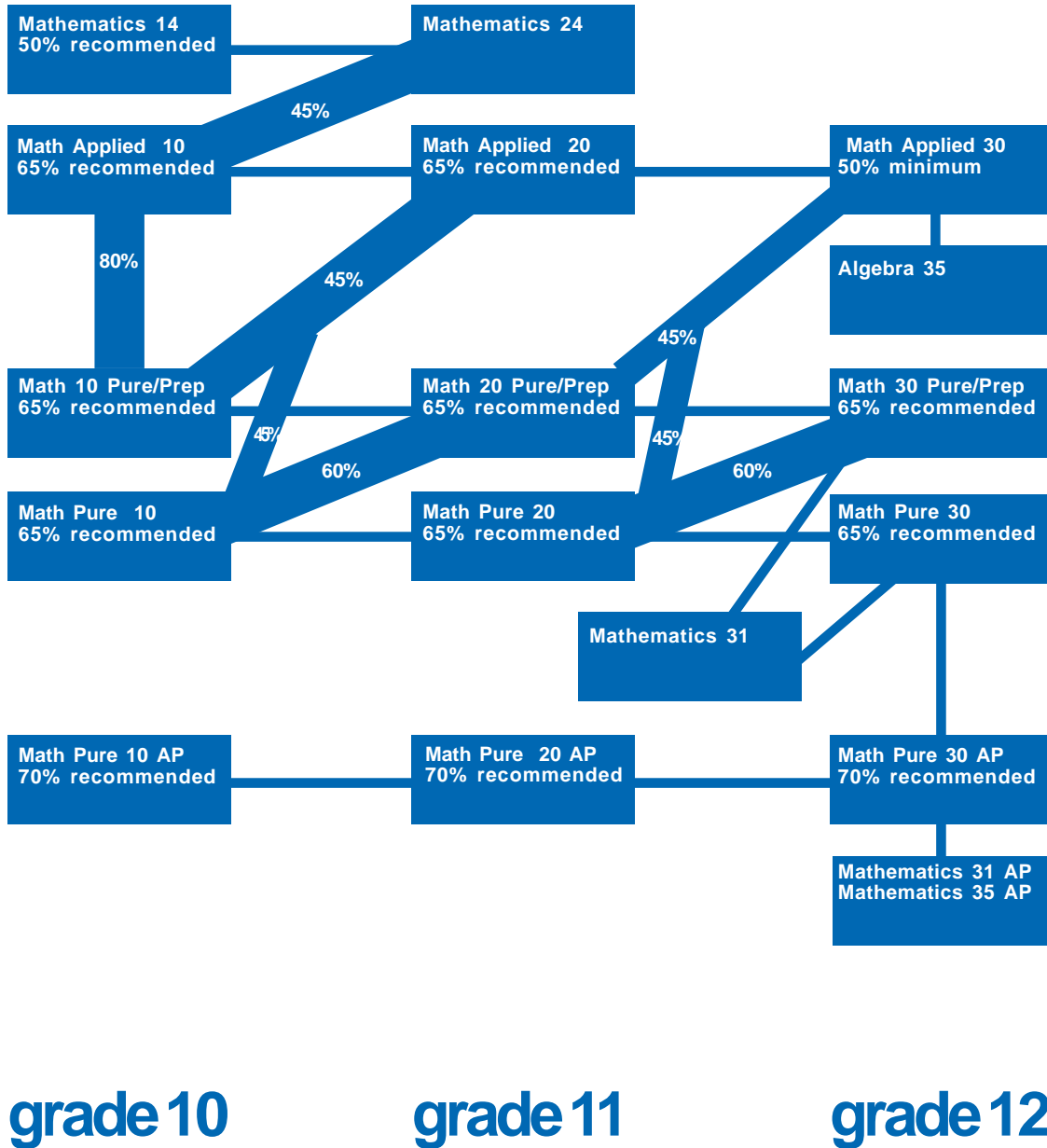


To ensure success in Mathematics courses, students are placed according to the recommendations for each course and then are carefully monitored as they proceed through the program.

# mathematics

# Mathematics Program

mathematics



# Mathematics

## General Information

To ensure success in mathematics courses at Paul Kane High School, students are placed according to the prerequisite mark required for each of the courses. All students are monitored as they proceed through the various math courses. For this mathematics program, it is important that a student select one route for all three courses.

Students considering post-secondary options should seek guidance when choosing mathematics courses.

Math Pure 10 – 20 – 30 route contains a three course sequence which provides the opportunity to take Math 31. These courses are based on a rigorous and theoretical approach to prepare students for math-intensive courses beyond high school. Students write an Alberta Education Diploma Exam in Mathematics Pure 30 which counts for 50% of the final mark.

Math Applied 10 – 20 – 30 route contains a three course sequence which is the mainstream for senior high students. These courses meet the requirements for many programs at technical schools and colleges. This route allows some extra time to assist those students who have had difficulty with mathematics in the past. Students write an Alberta Education Diploma Exam in Mathematics Applied 30 which counts for 50% of the final mark.

Algebra 35 is a course after successful completion of Math Applied 30. N.A.I.T. and the University of Alberta will provide acceptance of this course for entry to a much wider range of program-

ming. As of May 2005, N.A.I.T. will accept a 65% in Algebra 35 as an equivalent to successful completion of Math Pure 30 for all programs. There will be a final exam worth 40% designed by the Paul Kane Mathematics Department.

Math 14 – 24 route contains a two course sequence and is designed for those students who have experienced difficulty with mathematics. It concentrates on basic mathematical concepts with an emphasis on the everyday use of mathematics. Topics such as measurement, percent, and consumer related concepts make these two courses very practical as preparation for many job situations.

Math Pure 10AP – 20AP – 30AP – Math 31AP – 35AP route contains a five course sequence which provides enrichment and additional

scholastic challenge in high school mathematics. These courses will contain the appropriate content so that students will write the AP Calculus AB exam or the AP Calculus BC exam in May of the third year of the program. This series of courses provides students with a first year university course. Depending on the post-secondary institution, students may receive credit or placement if students receive a 4 or 5 on the Advanced Placement Calculus BC Examination. Admission to this route requires meeting certain criteria: a commitment to academic achievement; an honours average; an understanding and acceptance of the time involved, both in terms of study and homework; teacher recommendations; and parental approval and support.



The use of calculators for all mathematics courses has been approved by Alberta Education. In keeping with this policy, the Paul Kane High School Mathematics department would recommend for:

- a) Math 14, 24 - a scientific calculator
- b) Math Pure 10, 20, 30, Math 31, Applied 10, 20, 30 -- TI-83 or TI-83+ or TI-84+graphing calculator

In accordance with the Alberta Education Calculator Policy for Diploma Examinations, the staff at Paul Kane High School will adhere to the policy for all course-related activities, eg. tests, quizzes, assignments. Students will be required to sign a form at the beginning of the course indicating that they have read and understood the policy.

Mathematics Pure 30 is a pre or co-requisite for Mathematics 31. Students may take Mathematics Pure 30 and Mathematics 31 at the same time.

### **Math Pure10 (5 Credits)**

Real numbers, number patterns, polynomials, rational expressions and equations, relations and functions, coordinate geometry, trigonometry, statistics and probability.

### **Math Pure 10/ Math Prep 10 (8 Credits)**

These courses include all of the topics listed in Math Pure 10 but will be taught in 9 classes a week instead of 6. This course is designed for students who wish to enrol in the Math Pure 10 course but do not excel in this subject matter. It provides students the opportunity to review/reinforce the

concepts and time to practice these skills while covering the Math Pure 10 curriculum. Upon successful completion, students will receive 3 credits for Math Prep 10 and 5 credits for Math Pure 10.

### **Math Applied 10 (5 Credits)**

Measurement, number pattern in tables, relations and functions, sampling, line segments, linear functions, trigonometry.

Students who achieve 80% or better in Math Applied 10 may wish to take Math Pure 10.

### **Math 10 Prep (5 Credits)**

#### **– Summer School**

**Students with 50 – 65% in Math 9 must take this course before taking Math Pure 10.**

Number sense, powers and

exponents, algebraic operations, linear equations and inequalities, measurement, trigonometry, transformations, data analysis.

Students who achieve 80% or better in Summer School Math Prep 10 can proceed to Math Pure 10. Students who achieve 65% - 80% in Math Prep 10 should take Math Applied 10. Students between 50% - 65% can proceed directly to Math 24.

### **Math 14 (5 Credits)**

Order of operations, integers, patterns, puzzles, decimals, graphs, fractions, measurement, equations, ratios, rates, percents, angles, circles, central tendencies, theorem of Pythagoras.



### **Math Pure 10AP (5 Credits)**

Math Pure 10AP includes Math Pure 10 course content and systems of equations and linear inequalities.

### **Math Pure 20 (5 Credits)**

Systems of equations, linear inequalities, quadratic functions, quadratic and polynomial equations, functions, reasoning, the circle, coordinate geometry, trigonometry and personal finance.

### **Math Pure 20/Prep (8 Credits)**

These courses include all of the topics listed in Math Pure 20 but will be taught in 9 classes a week instead of 6. This course is designed for students who wish to enrol in Math Pure 20 course but do not excel in this subject matter. It provides the opportunity to review/reinforce the concepts and time to practice these while covering the Math Pure 20 curriculum. Upon successful completion, students will receive 3 credits for Math Pure 10 Bridge and 5 credits for Math Pure 20.

### **Math Applied 20 (5 Credits)**

Financial mathematics; quadratic functions and circle geometry; design and layout; data presentation and inference; in equations and linear programming.

### **Math 24 (5 Credits)**

Arithmetic Operations, Simple and Compound Interest, using spreadsheet templates, Perimeter, Area, Volume, Measurement, Statistics, Probability, Data Analysis, Surface Area, Spatial Problem Solving and Analyze Graphs and Charts.

### **Math Pure 20AP (5 Credits)**

Math Pure 20AP includes Math Pure 20 course content and transformations from the Math Pure 30 course.

### **Math 30 Pure (5 Credits)**

Transformations, exponents and logarithms, conics, trigonometric functions, trigonometric equations, sequences and series, combinatorics, probability and probability distributions.

### **Math Pure 30/Prep (8 Credits)**

These courses include all of the topics listed in Math Pure 30 but will be taught in 9 classes instead of 6. This course is designed for students who wish to enrol in Math Pure 30 course but do not excel in this subject matter. It

provides the opportunity to review/reinforce the concepts and the time to practice these while covering the Math Pure 30 curriculum. Upon successful completion, students will receive 3 credits for Learning Strategies 35 and 5 credits for Math Pure 30.

### **Math Applied 30 (5 Credits)**

Normally and binomially distributed data; matrix and vector problems; periodic, fractal and recursive patterns; financial decision making; analysis and solutions of cost and design problems.

### **Algebra 35 (5 Credits)**

Polynomials and factoring, rational expressions, systems of equations, quadratic equations, equations, exponents and logarithms, quadratic relations, transformations, trigonometric functions, trigonometric



identities and equations with optional units: inequalities and absolute value, permutations and combinations and sequences and series. The course is designed to be delivered without a graphing calculator as this tool is not employed in many of the post secondary mathematics institutions.

### **Math Pure 30AP (5 Credits)**

Math Pure 30 course content and as well, an introduction to differential calculus including limits, derivatives, displacement, velocity and acceleration.

### **Math 31 (5 Credits)**

Limits and rates of change, derivatives, applications of derivatives, extreme values, curve sketching, trigonometric functions, derivatives of trigonometric functions, exponential and logarithmic functions, differential equations, area, and integrals.

Math 31 is required by the following faculties and programs at the University of Alberta: Engineering, Honours Math, Mathematics Applied, Mathematical Physics, Mathematics, Mathematics and Economics. Math 31 is recommended in several other programs

at the University of Alberta. See a counsellor for information on university requirements.

### **Math 31AP (5 Credits)**

Differentiation, maxima and minima problems, differentiation of complex functions, mean value theorem and L'Hospital's rule, implicit differentiations and graph sketching, related rate problems, antiderivatives and their applications, techniques of integration, definite integrals and their applications, calculus of trigonometry, calculus of logarithmic and exponential functions. This content is usually found in most first-year university calculus courses. This course will prepare students to write the Advanced Placement Calculus AB exam in May.

### **Math 35AP (3 Credits)**

This course includes extra calculus topics not covered in Mathematics 31AP: calculus of vectors, parametric equations and polar equations, additional topics in integration and differential equation as well as the study of series and Taylor Polynomials. This content will prepare students to write the Advanced Placement Calculus BC exam in May. Students should check with Director of Admissions of the post-secondary institutions to see if a mark of 4 or 5 will give them credit or placement in a first year calculus course.

