

# HIGH SCHOOL MATHEMATICS

## AT A GLANCE



### MATHEMATICS 10C

Mathematics 10C students determine the surface area and volume of 3-D objects and use trigonometric ratios to solve problems involving right triangles. They simplify expressions that involve powers with integral and rational exponents and simplify or factor polynomial expressions. At this level, students also analyze linear relations, solve systems of linear equations and solve problems related to both of these sets of skills.

### MATHEMATICS 20-1

Mathematics 20-1 students investigate arithmetic and geometric patterns and use the sine and cosine laws to solve problems involving triangles. They investigate the properties of radicals and rational expressions. Mathematics 20-1 students also analyze the characteristics of absolute value functions and quadratic functions, solve quadratic equations and systems of equations in various ways, and analyze the relationship between a function and its reciprocal.

### MATHEMATICS 30-1

Mathematics 30-1 students investigate the properties of logarithms; study the characteristics and transformations of trigonometric, polynomial, exponential and logarithmic functions by sketching and analyzing their graphs; and solve equations and problems related to these functions. Students also use basic counting principles to determine the number of permutations or combinations of the elements of a set to solve problems.

### MATHEMATICS 31

Mathematics 31 students determine the limit of a function at finite or infinite values of the independent variable. They use derivative theorems to determine the derivative of a function, either explicitly or implicitly, and use derivatives to sketch graphs of functions and solve optimization problems. They also investigate the relationship between differentiation and integration.

### MATHEMATICS 20-2

Mathematics 20-2 students use proportional reasoning to solve real-life problems involving 2-D shapes and 3-D objects. They use the properties of angles and triangles, including the sine and cosine laws, to solve problems; use reasoning to prove conjectures; use spatial reasoning to solve puzzles; and solve problems that involve radicals. They interpret statistical data, solve problems involving quadratics and research and present a mathematical topic of their choice.

### MATHEMATICS 30-2

Mathematics 30-2 students use numerical and logical reasoning to solve puzzles, and solve real-life problems about the probability of events occurring. They solve problems algebraically involving rational equations; investigate exponential, logarithmic, polynomial and sinusoidal functions; and research and present a mathematical topic of their choice.

### MATHEMATICS 10-3

Mathematics 10-3 students solve linear and area measurement problems of 2-D shapes and 3-D objects using SI and imperial units. They use spatial reasoning to solve puzzles; solve problems involving right triangles and angles; solve unit pricing, currency exchange and income problems; and manipulate formulas to solve problems. They also use scale factors and parallel and perpendicular lines to solve problems.

### MATHEMATICS 20-3

Mathematics 20-3 students solve surface area, volume and capacity problems. They use primary trigonometry to solve problems involving two or three right triangles, and model and draw 3-D objects and their views to scale. They use numerical reasoning to solve puzzles; create and analyze personal budgets; use proportional reasoning, unit analysis and manipulation of formulas to solve problems; and create and interpret graphs. Students use their understanding of slope and rate of change to interpret graphs.

### MATHEMATICS 30-3

Mathematics 30-3 students investigate the limitations of measuring instruments, use trigonometry to solve problems involving triangles, and describe and illustrate properties of polygons. They investigate slides, rotations, flips and size changes of 2-D shapes or 3-D objects; they use logical reasoning to solve puzzles; and they solve various other problems involving financial situations, linear relations and probability.

### MATHEMATICS 10-4

Knowledge and Employability Mathematics 10-4 students solve everyday problems involving numbers and percents; explore patterns, variables, expressions and equations to solve problems; and solve problems involving estimation, measurement and comparison of objects. Students use visualization and symmetry to explore objects, shapes, patterns and designs; develop and apply a plan to collect, display and analyze data and information; and connect mathematical ideas to their everyday lives. Students who have experienced challenges or difficulty with their skills will be provided with additional strategies for success in the Knowledge and Employability -4 course sequence.

### MATHEMATICS 20-4

Knowledge and Employability Mathematics 20-4 students solve everyday problems involving numbers and percents, and decide if the processes used are reasonable. They explore patterns, variables and expressions, and interpret variables, equations and relationships, to solve problems in practical situations. They estimate, measure and compare objects; read and interpret scale drawings and maps; develop and apply a plan to collect, display and analyze information; and use probability and statistics to make predictions and decisions. In most of their studies, Mathematics 20-4 students connect mathematical ideas to their everyday lives. Students who have experienced challenges or difficulty with their skills will be provided with additional strategies for success in the Knowledge and Employability -4 course sequence.



LEARN MORE ABOUT YOUR  
CHILD'S EDUCATION  
BY VISITING

**My Child's Learning: A Parent  
Resource**

<http://www.mychildslearning.alberta.ca>



## ASSESSMENT

Learning is assessed using a variety of tools and strategies within the classroom. Ask the teacher what methods they are using. The different assessment methods tell you, your teen and your teen's teacher about your teen's strengths, the areas in which they might grow and how well they are doing throughout a course. At the end of the course, your teen will be assessed and their achievement will be reported so that you know if they have achieved the expected learning outcomes for the course.

At the end of Mathematics 30-1 or Mathematics 30-2, your teen will write a provincial diploma examination. Your teen's final mark in Mathematics 30-1 or Mathematics 30-2 will be the average of the school-awarded mark and the diploma examination mark (the average is determined by taking 50% of the school-awarded mark and adding it to 50% of the diploma examination mark). Your teen must achieve a final mark of 50% or higher to obtain credits for the course. For general information about diploma examinations and for course-specific diploma examination information, contact the Assessment Sector by telephone at 780-427-0010 (toll-free within Alberta by first dialling 310-0000) or by e-mail at [LAcontact@edc.gov.ab.ca](mailto:LAcontact@edc.gov.ab.ca).

You play an integral role in your teen's education by providing the encouragement and support he or she needs to succeed.

## RESOURCES

A variety of digital and print resources from many different sources help students learn. Alberta Education reviews and authorizes many student and teacher resources that support learning and teaching in the classroom. Additionally, teachers may select, and bring into the classroom, numerous other innovative and creative resources to create rich learning experiences for your teen. Visit LearnAlberta.ca (<http://www.learnalberta.ca/>) or the Authorized Resources Database (<http://education.alberta.ca/apps/lrdb/>) to learn more about the resources your child may encounter.

## WHERE CAN I GET MORE INFORMATION?

### CITIZENSHIP AND CAREER PATHWAYS

Telephone: 780-427-2984

Fax: 780-422-0576

E-mail: [curric.contact@education.gov.ab.ca](mailto:curric.contact@education.gov.ab.ca)

### FRENCH LANGUAGE EDUCATION SERVICES

Telephone: 780-427-2940

Fax: 780-422-1947

E-mail: [DEF@edc.gov.ab.ca](mailto:DEF@edc.gov.ab.ca)