

Student Course Outline: MHF 4UI – Grade 12 Advanced Functions, University Preparations

Textbook Calculus and Advanced Functions, McGraw-Hill Ryerson. Price: \$110.00

Teachers

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Units of Study

Unit	Title	Essential Skills
1	Polynomial Functions	<ul style="list-style-type: none"> <input type="checkbox"/> Recognize a polynomial expression and equation of a polynomial function. <input type="checkbox"/> Describe key features of polynomial functions. <input type="checkbox"/> Sketch the graph of a polynomial function given in factored form using its key features. <input type="checkbox"/> Graph functions of the form $y = af(k(x - d)) + c$. <input type="checkbox"/> Solve first degree polynomial inequalities.
2	Rational Functions	<ul style="list-style-type: none"> <input type="checkbox"/> Determine, key features of the graphs of rational functions, sketch its graph and make connections between the algebraic and graphical representations. <input type="checkbox"/> Sketch the graph of a simple rational function using its key features, given the algebraic representation of the function. <input type="checkbox"/> Solve simple rational equations in one variable algebraically. <input type="checkbox"/> Determine solutions to simple rational inequalities.
3	Rates of change	<ul style="list-style-type: none"> <input type="checkbox"/> Demonstrate an understanding of secants and tangents. <input type="checkbox"/> Use limits to calculate the tangent value (instantaneous rate of change). <input type="checkbox"/> Calculate and interpret average rates of change of functions (secant). <input type="checkbox"/> Sketch a graph that represents a relationship involving rate of change. <input type="checkbox"/> Recognize examples rates of change arising from real-world situations.
4	Exponential and Logarithmic Functions	<ul style="list-style-type: none"> <input type="checkbox"/> Use the laws of logarithms to simplify and evaluate numerical expressions. <input type="checkbox"/> Determine key features of the graphs of logarithmic and exponential functions. <input type="checkbox"/> Solve problems based on real applications of exponential and logarithmic functions. <input type="checkbox"/> Solve exponential and logarithmic equations in one variable algebraically including problems arising from real-world applications.
5	Trig Functions 1	<ul style="list-style-type: none"> <input type="checkbox"/> Represent radian measure in terms of pi and as a rational number. <input type="checkbox"/> Determine the primary trig ratios and the reciprocal trig ratios of angles in radian measure. <input type="checkbox"/> Sketch the graphs of $y = a\sin(k(x - d)) + c$ and $y = a\cos(k(x - d)) + c$ in radians. <input type="checkbox"/> Determine and describe the key properties of the above functions in terms of radians (e.g period, amplitude, phase shift and vertical translation). <input type="checkbox"/> Understand the difference between reciprocal trig ratios and inverse trig ratios. <input type="checkbox"/> Represent a sinusoidal function with an equation, given its graph. <input type="checkbox"/> Solve application problems involving sinusoidal functions (e.g. Tides, hours of daylight etc.).
6	Trig Functions 2	<ul style="list-style-type: none"> <input type="checkbox"/> Recognize equivalent trig ratios using related and co-related angles. <input type="checkbox"/> Use compound angle formulas (addition and subtraction, double angle etc.) to determine exact values. <input type="checkbox"/> Recognize that trig identities are equations that are true for every value in the domain. <input type="checkbox"/> Prove trig identities. <input type="checkbox"/> Solve linear and quadratic trig equations and their related problems.
7	Characteristics of Functions	<ul style="list-style-type: none"> <input type="checkbox"/> Recognize real world applications of combinations of functions and solve related problems graphically. <input type="checkbox"/> Explain properties of functions formed by adding, subtracting, multiplying and dividing functions. <input type="checkbox"/> Determine the composition of two functions through a table of values, algebraically and graphically. <input type="checkbox"/> Solve problems involving the composition of two functions from real world applications. <input type="checkbox"/> Demonstrate that the composition of a function and its inverse is itself. <input type="checkbox"/> Solve graphically and numerically equations and inequalities whose solutions are not accessible.

Reporting

Parent-Teacher Interviews: April 8, 2020

Report Card Distribution: April 27, 2020 and July 6, 2010

Parents are encouraged to contact the teacher whenever they have a concern or question.

Supplies (Mandatory for every class!)

Three ring binder with paper.

Pencils, erasers, pens and ruler.

Scientific Calculator: must have trigonometric functions: (sin, cos, tan).

Please Note: iPods, cell phones and other electronic storage devices may not be used in class or during evaluations as a calculator.

Graph paper: you may purchase this from your teacher when graphing units arise.

Expectations

Food/Drink: There is no food or drink (except water) allowed in the classroom.

Homework: Mathematical skills are developed in the classroom and strengthened with homework. Homework must be completed daily. If you have trouble completing your homework or understanding a topic, see your teacher for extra help. Do not let difficulties drag on until the end of a unit.

Attitude: Come to class with a positive attitude. Be diligent in your work, attentive during lessons, volunteer ideas, ask questions and work quietly and cooperatively. Come prepared with all required materials, be on time and be prepared to work for the entire period. Work to the best of your ability and respect the rights of others to learn.

Absences: The Waterloo-Oxford District Secondary School policy states that all students are expected to attend all classes and arrive on time. Excessive absences may contribute, directly or indirectly, to the student losing the credit. When the bell rings students should be in their seats ready to begin class. If a student arrives late he/she should sit down quietly and join the class.

Please make sure that you check your WRDSB email account and our course website to get caught up on any material you might have missed while you were away.

Missed

Quizzes/Tests: Students are expected to write missed quizzes/tests on the first day back to school. See your teacher to write your test.

In the event that the student does not take responsibility to write the test (as stated above), his/her teacher will:

- speak with the student to negotiate a new test date.
- communicate with the student's parent or guardian about the missed test.

Tests not completed after the negotiated date will be designated as incomplete. The essential learning skills required for this test will still need to be demonstrated and the teacher will use his/her professional judgment to determine an appropriate mark.

Extra Help: I am happy to provide extra help as needed. Please speak with me to arrange a time that works with both our schedules.