Self-Assessment on Essential Learning Targets for Chapter 1 – Limits

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

P = proficient G = getting there N = not yet

Chapter 1 - Limits	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Knows the basic definition of a limit						
Expresses limits symbolically using correct notation						
Interprets limits expressed symbolically						
Evaluates one-sided limits						
Evaluates limits that approach infinity						
Knows the 3 conditions for a limit to exist, can use these to justify why a limit does not exist at an x-value						
Estimates the limits of functions based on a graph						
Estimates the limits of functions based on a table						
Evaluates limits of sums, differences, products, quotients, and composite functions using the basic theorems of limits and algebraic rules						
Evaluates limits using algebraic manipulation						
Evaluates limits involving trigonometric functions						
Evaluates limits using the Squeeze Theorem						
Explains asymptotic and unbounded behavior of functions using limits						
Evaluates limits using comparative growth rates						
Determines relative magnitudes of functions and their rates of change using limits						
Knows the definition of continuity (3 conditions for $f(x)$ to be continuous at $x = c$)						
Knows the 3 types of discontinuity						
Knows that polynomial, rational, power, exponential, logarithmic and trigonometric functions are all continuous in their domains						
Applies the Intermediate Value Theorem and justifies using condition of continuity						

Self-Assessment on Essential Learning Targets for Chapter 2 - Derivatives

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

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Chapter 2 - Derivatives	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Knows and applies the definition of a general derivative						
Knows and applies the definition of a derivative at a specific value of *x*						
Knows how to compute an average rate of change over an interval						
Knows that the derivative is the instantaneous rate of change of a function						
Expresses derivatives symbolically using the various methods of correct notation						
Estimates the derivative at a point using information from a table or graph						
Calculates derivatives of selected functions including polynomial, power, rational and trigonometric						
Applies appropriate derivative rules including sum, difference, product and quotient						
Applies the chain rule to differentiate composite functions						
Differentiates implicitely defined expressions and understands how the chain rule relates to implicit differentiation						
Uses the chain rule to find the derivative of an inverse function						
Repeats the differentiation process to find higher order derivatives						
Expresses higher order derivatives using the various methods of correct notation						
Knows the 3 conditions for differentiability and recognizes the connection between differentiability and continuity						
Interprets the meaning of a derivative within the context of a problem using correct units						
Solves problems involving the slope of a tangent line						
Uses the tangent line to approximate values on a function near the point of tangency						
Expresses information about rates of change in applied contexts						
Solves rectilinear motion problems involving position, speed, velocity and acceleration						
Solves related rates problems						

Self-Assessment on Essential Learning Targets for Chapter 3 – Function Behavior

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

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Chapter 3 – Function behavior	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Uses the first derivative to determine intervals of increase or decrease						
Uses the first and/or second derivatives to determine local (relative) extrema						
Uses the first derivative to determine global (absolute) extrema						
Knows the hypothesis and conclusion of the Extreme Value Theorem.						
Uses the second derivative to determine intervals of concavity and points of inflection						
Knows how f, f' and f'' are related to one another						
Identifies key features of functions and their derivatives related to their graphical, numerical and analytical representations						
Uses the derivative to solve optimization problems						
Applies the Mean Value Theorem to describe the behavior of a function over an interval. Shows that the hypothesis has been satisfied before stating the conclusion.						

Self-Assessment on Essential Learning Targets for Chapter 4 – Integrals

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

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Chapter 4 - Integrals	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Knows the relationship between a derivative and an antiderivative						
Finds antiderivatives using reverse differentiation when it applies						
Computes left, right and midpoint Riemann sums using either uniform or non-uniform partitions						
Computes trapezoidal sums using uniform or non-uniform partitions						
Translates the information in a definite integral into the limit of a related Riemann sum, and the limit of a Riemann sum can be written as a definite integral						
Knows and applies the definition of a definite integral, and relates this to the limit of the Riemann sum						
Approximates definite integrals for functions represented graphically, numerically, algebraically and verbally						
Knows the connection between the definite integral and area and evaluates definite integrals using geometry when applicable						
Applies the properties of definite integrals including integrals of a constant times a function, the sum of two functions, reversal of limits and the integral of a function over adjacent intervals						
Evaluates definite integrals of functions containing removable or jump discontinuities						
Uses the Fundamental Theorem of Calculus to define new functions (when a variable appears in a limit)						
Solves problems in which the graphical, numerical, analytical, and verbal representations of a function provide information about a new function found using the Second Fundamental Theorem of Calculus.						
Uses the Fundamental Theorem of Calculus to evaluate definite integrals						
Writes and evaluates integrals using proper notation						
Knows that not every function has an antiderivative						
Evaluates integrals using techniques such as long division, completing the square and substitution of variables						
Interprets the meaning of a definite integral within a problem. Knows that a function defined as a definite integral represents an accumulation of a rate of change						
Solves problems using the knowledge that the definite integral of the rate of change of a quantity over an interval gives the net change of that quantity over that interval						
Computes the average value of a function over an interval						
Solves rectilinear motion problems using the knowledge that the definite integral of velocity represents the particle's displacement over the interval, and the definite integral of speed represents the particle's total distance traveled over the interval						

Self-Assessment on Essential Learning Targets for Chapter 5 – Transcendental Functions

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

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Chapter 5 – Transcendental Functions	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Uses the definition of the derivative to differentiate exponential and logarithmic functions						
Knows the specific rules for calculating the derivatives of exponential, logarithmic and inverse trigonometric functions						
Knows that solutions to differential equations are functions or families of functions						
Uses derivatives to verify that a function is a solution to a given differential equation						
Uses antidifferentiation to find specific solutions to differential equations with given initial conditions, including applications to motion along a line and exponential growth and decay						
Solves differential equations by separation of variables						
States the restricted domain for the solution to a differential equation						
Can find both a general solution to a differential equation as well as a particular solution satisfying a given initial condition.						
Writes the model for exponential growth and decay arising from the statement "The rate of change of a quantity is proportional to the size of the quantity" as $\frac{dy}{dt} = ky$						
Understands that slope fields provide visual clues to the behavior of solutions to first order differential equations						

Self-Assessment on Essential Learning Targets for Chapter 7/8 – Area/Volume/Arc Length

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

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Chapter 7/8 – Area, Volume, Arc Length	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Uses integrals to calculate areas of certain regions in a plane.						
Uses definite integrals to calculate volumes of solids with known cross sections, including discs and washers.						
Uses definite integrals to calculate the length of a planar curve defined by a function.						
Techniques for finding antiderivatives include algebraic manipulation such as long division, completing the square, substitution of variables and integration by parts						

Self-Assessment on Essential Learning Targets for Chapter 8 – Integration Techniques

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

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Chapter 8 – Integration Techniques	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Uses Euler's Method to approximate a solution or a point on a solution curve of a differential equation						
Techniques for finding antiderivatives include algebraic manipulation such as long division, completing the square, substitution of variables, integration by parts and nonrepeating linear partial fractions						
Evaluates limits of indeterminate forms $\frac{0}{0}$ and $\frac{\infty}{\infty}$ using L'Hopital's Rule						
Knows that an improper integral is an integral that has one or both limits infinite or has an integrand that is unbounded in the interval of integration.						
Uses limits to determine the value of definite improper integrals.						
Uses antidifferentiation to find specific solutions to differential equations with given initial conditions, including applications to logistic growth						
Knows that the model for logistic growth that arises from the statement, "The rate of change of a quantity is jointly proportional to the size of the quantity and the difference between the quantity and the carrying capacity " is $\frac{dy}{dt} = ky(a - y)$						

Self-Assessment on Essential Learning Targets for Chapter 9 Part 1 – Series and Convergence

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

P = proficient G = getting there N = not yet

Chapter 9 Part 1– Series and Convergence	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Knows that the nth partial sum is defined as the sum of the first n terms of a sequence						
Knows that an infinite series of numbers converges to a real number S (or has a sum S) if and only if the limit of its sequence of partial sums exists and equals S						
Recognizes common series including geometric, harmonic and p-series						
Knows that a series may be absolutely convergent, conditionally convergent or divergent.						
Knows that if a series converges absolutely, then it converges.						
Knows that if a series converges absolutely, then any series obtained from it by regrouping or rearranging the terms has the same value						
Uses the alternating series error bound to estimate how close a partial sum is to the value of an infinite series						
In addition to examining the limit of the sequence of partial sums of a series, uses a variety of methods for determining convergence or divergence including the nth term test, comparison test, limit comparison test, integral test, ratio test and alternating series test						

Self-Assessment on Essential Learning Targets for Chapter 9 Part 2 – Power Series

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

P = proficient G = getting there N = not yet

Chapter 9 Part 2– Power Series	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Knows how to calculate the coefficients for Taylor polynomials.						
Understands that Taylor polynomials for a function centered at x = a can be used to approximate function values near x = a.						
Understands that in many cases, as the degree of the Taylor polynomial increases, the nth degree polynomial will converge to the original function over some interval.						
Uses the Lagrange error bound to bound the error of a Taylor approximation to a function.						
In some situations where the signs of a Taylor polynomial are alternating, uses the alternating series error bound to bound the error of a Taylor approximation to a function.						
Recognizes series notation for a power series.						
Constructs Maclaurin series for other functions using Maclaurin series for sin(x), cos(x) and e^x.						
Knows that a Taylor polynomial for a function is a partial sum of the Taylor series for the function.						
Derives power series for functions using various methods including algebraic processes, substitutions, properties of geometric series, term-by-term integration and term-by-term differentiation.						
Uses the ratio test to determine the radius of convergence of a power series.						
Knows that if a power series has a positive radius of convergence, then the power series is the Taylor series of the function to which it converges over the open interval.						
Knows that the radius of convergence of a power series obtained by term-by-term differentiation or term-by-term integration is the same as the radius of convergence of the original power series.						

Self-Assessment on Essential Learning Targets for Chapter 10 – Vectors, Parametric and Polar

Put an 'x' to mark where you are next to each topic listed. Do this once at the beginning of the unit and again at the end of the unit, prior to the test. At the end of the unit for any topics marked 'not yet', look through your formative assessments (quizzes, homework) as well as your other resources (notes, smart board pdfs, videos) to find additional help and practice. You also might want to bring these topics up in class during test review days and/or CORE sessions.

P = proficient G = getting there N = not yet

Chapter 10 – Vectors, Parametric and Polar	**Beg of Unit**			**End of Unit**		
Essential Learning Target	**N**	**G**	**P**	**N**	**G**	**P**
Extends methods of calculating derivatives of real-valued functions to vector-valued functions, parametric functions, and functions in polar coordinates.						
Uses derivatives to determine velocity, speed and acceleration for a particle moving along curves given by parametric or vector-valued functions.						
Uses definite integrals to determine displacement, distance and position of a particle moving along a curve given by parametric or vector-valued functions.						
Uses derivatives of r, x, and y with respect to θ and first and second derivatives of y with respect to x to provide information about a curve given by a polar equation $r = f(\theta)$.						
Uses definite integrals to compute areas of regions bounded by polar curves.						
Uses definite integrals to compute the length of a planar curve defined by a function or by a parametrically defined curve.						