

GRADE LEVEL: HIGH SCHOOL

SUBJECT: PRE-CALCULUS

DATE: 2021 - 2022

GRADING PERIOD: QUARTER 1

MASTER COPY REVISED 5/20/2021

CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCABULARY	PRIORITY
<b>FUNCTIONS</b>					
<ul style="list-style-type: none"> <li>FUNCTIONS</li> <li>MAXIMUM</li> <li>MINIMUM</li> <li>SYMMETRY</li> <li>END BEHAVIOR</li> </ul>	<p><b>PC.F.1:</b> For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</p>	<ul style="list-style-type: none"> <li>Interpret key features of graphs and tables that model a function.</li> <li>Sketch graphs of functions given a verbal description.</li> <li>Identify where a function is increasing, decreasing, positive or negative, relative maximums and minimums, symmetries, and end behavior.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher Observation</li> <li>Class Discussion</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Intercepts</li> <li>Intervals</li> <li>Symmetry</li> <li>Maximum</li> <li>Minimum</li> <li>End behavior</li> </ul>	Critical
<ul style="list-style-type: none"> <li>LINEAR MODELS</li> <li>MEDIAN FIT</li> <li>REGRESSION</li> <li>LEAST SQUARES REGRESSION</li> </ul>	<p><b>PC.F.2:</b> Find linear models by using median fit and least squares regression methods, making use of technology. Decide which among several linear models gives a better fit. Interpret the slope and intercept in terms of the original context.</p>	<ul style="list-style-type: none"> <li>Find linear models by using median fit and least squares regression methods.</li> <li>Choose the linear model that is the best fit.</li> <li>Interpret the slope and intercept.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher observation</li> <li>Class discussion</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Median fit regression</li> <li>Least squares regression</li> </ul>	Important
<ul style="list-style-type: none"> <li>COMPOSITE FUNCTIONS</li> </ul>	<p><b>PC.F.3:</b> Compose functions and find the domain of composite functions.</p>	<ul style="list-style-type: none"> <li>Compose functions <math>f \circ g(x)</math> and <math>g \circ f(x)</math>.</li> <li>Find the domain of composite functions.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher observation</li> <li>Class discussion</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Composite functions</li> </ul>	Important

CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCABULARY	PRIORITY
<b>FUNCTIONS</b>					
<ul style="list-style-type: none"> <li>• INVERSE FUNCTION</li> </ul>	<p><b>PC.F.4:</b> Determine if a graph or table has an inverse, and justify if the inverse is a function, relation, or neither. Identify the values of an inverse function/relation from a graph or a table, given that the function has an inverse. Derive the inverse equation from the values of the inverse.</p>	<ul style="list-style-type: none"> <li>• Determine if a function has an inverse.</li> <li>• Justify if an inverse is a function, relation, or neither.</li> <li>• Given a function, derive the inverse.</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher observation</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Inverse function</li> <li>• Relation</li> </ul>	Critical
<ul style="list-style-type: none"> <li>• INVERTIBLE FUNCTION</li> <li>• NON-INVERTIBLE FUNCTION RESTRICTED DOMAIN</li> </ul>	<p><b>PC.F.5:</b> Produce an invertible function from a non-invertible function by restricting the domain.</p>	<ul style="list-style-type: none"> <li>• Create an invertible function from a non-invertible function by restricting the domain.</li> </ul>	<ul style="list-style-type: none"> <li>• Class discussion</li> <li>• Teacher observation</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Invertible</li> <li>• Non-invertible</li> </ul>	Important
<ul style="list-style-type: none"> <li>• EVEN FUNCTIONS</li> <li>• ODD FUNCTIONS</li> </ul>	<p><b>PC.F.6:</b> Recognize even and odd functions from their graphs and algebraic expressions.</p>	<ul style="list-style-type: none"> <li>• Identify even and odd functions.</li> </ul>	<ul style="list-style-type: none"> <li>• Class discussion</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Even function</li> <li>• Odd function</li> </ul>	Important

CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCABULARY	PRIORITY
<b>QUADRATIC, POLYNOMIAL AND RATIONAL EQUATIONS AND FUNCTIONS</b>					
<ul style="list-style-type: none"> <li>• COMPLETING THE SQUARE</li> <li>• QUADRATIC FORMULA</li> </ul>	<b>PC.QPR.1:</b> Use the method of completing the square to transform any quadratic equation into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	<ul style="list-style-type: none"> <li>• Use completing the square to transform any quadratic equation to the form <math>(x-p)^2=q</math>.</li> <li>• Derive the quadratic formula.</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher observation</li> <li>• Student presentation</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Quadratic Formula</li> </ul>	Critical
<ul style="list-style-type: none"> <li>• CONJUGATES</li> <li>• COMPLEX NUMBERS</li> </ul>	<b>PC.QPR.2:</b> Understand and use addition, subtraction, multiplication, and conjugation of complex numbers.	<ul style="list-style-type: none"> <li>• Add, Subtract, multiply complex numbers.</li> <li>• Simplify complex expressions using the conjugates.</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher observation</li> <li>• Class discussion</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Complex numbers conjugates</li> </ul>	Important
<ul style="list-style-type: none"> <li>• COMPLEX PLANE</li> <li>• DISTANCE</li> <li>• MIDPOINT</li> </ul>	<b>PC.QPR.3:</b> Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	<ul style="list-style-type: none"> <li>• Calculate the distance between complex numbers.</li> <li>• Determine the midpoint of complex numbers as average of endpoints.</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Class discussion</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Complex plane</li> <li>• Distance</li> <li>• Midpoint</li> <li>• Modulus</li> </ul>	Important
<ul style="list-style-type: none"> <li>• REMAINDER THEOREM</li> <li>• FACTOR THEROEM</li> </ul>	<b>PC.QPR.4:</b> Know and apply the Remainder Theorem and the Factor Theorem.	<ul style="list-style-type: none"> <li>• Know and apply the remainder theorem.</li> <li>• Know and apply the factor theorem.</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher observation</li> <li>• Class discussion</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Remainder Theorem</li> <li>• Factor Theorem</li> </ul>	Important

CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCABULARY	PRIORITY
<b>QUADRATIC, POLYNOMIAL AND RATIONAL EQUATIONS AND FUNCTIONS</b>					
<ul style="list-style-type: none"> <li>FUNDAMENTAL THEOREM OF ALGEBRA</li> </ul>	<p><b>PC.QPR.5:</b> Understand the Fundamental Theorem of Algebra. Find a polynomial function of lowest degree with real coefficients when given its roots.</p>	<ul style="list-style-type: none"> <li>Apply and understand the Fundamental Theorem of Algebra.</li> <li>Determine polynomial functions of lowest degree with real coefficients when given its roots.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher observation</li> <li>Class discussion</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Fundamental Theorem of Algebra</li> </ul>	Critical
<ul style="list-style-type: none"> <li>RATIONAL FUNCTIONS</li> </ul>	<p><b>PC.QPR.6:</b> Graph rational functions with and without technology. Identify and describe features such as intercepts, domain and range, and asymptotic and end behavior.</p>	<ul style="list-style-type: none"> <li>Graph rational functions with and without technology.</li> <li>Identify and describe intercepts, domain and range, and asymptotic end behavior.</li> </ul>	<ul style="list-style-type: none"> <li>Class discussion</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Rational functions</li> <li>Intercepts</li> <li>Domain</li> <li>Range</li> <li>Asymptotic behavior</li> <li>End behavior</li> </ul>	Critical

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GRADING PERIOD: QUARTER 2

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CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCABULARY	PRIORITY
<b>EXPONENTIAL AND LOGARITHMIC FUNCTIONS</b>					
<ul style="list-style-type: none"> <li>LOGARITHMS</li> </ul>	<b>PC.EL.1:</b> Use the definition of logarithms to convert logarithms from one base to another and prove simple laws of logarithms.	<ul style="list-style-type: none"> <li>Convert logarithms from one base to another.</li> <li>Prove simple laws of logarithms.</li> </ul>	<ul style="list-style-type: none"> <li>Class discussion</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Logarithms</li> </ul>	Critical
<ul style="list-style-type: none"> <li>LAWS OF LOGARITHMS</li> </ul>	<b>PC.EL.2:</b> Use the laws of logarithms to simplify logarithmic expressions, approximate the value of a logarithmic expression, and solve logarithmic equations.	<ul style="list-style-type: none"> <li>Simplify logarithmic expressions using laws of logarithms.</li> <li>Find approximate values of logarithmic expressions.</li> <li>Solve logarithm equations.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher observation</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Laws of Logarithms</li> </ul>	Critical
<ul style="list-style-type: none"> <li>EXPONENTIAL FUNCTIONS</li> </ul>	<b>PC.EL.3:</b> Graph and solve real-world and other mathematical problems that can be modeled using exponential and logarithmic functions; interpret the solution and determine whether it is reasonable. Identify and describe features such as intercepts, domain, range, asymptotes, and end behavior.	<ul style="list-style-type: none"> <li>Graph and solve real-world problems that model exponential and logarithmic equations.</li> <li>Interpret solutions and determine if the solution is reasonable.</li> <li>Identify intercepts, domain, range, asymptotes, and end behavior.</li> </ul>	<ul style="list-style-type: none"> <li>Class discussion</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Exponential functions</li> </ul>	Important
<ul style="list-style-type: none"> <li>QUADRATIC, EXPONENTIAL, LOGARITHMIC, AND POWER REGRESSIONS</li> </ul>	<b>PC.EL.4:</b> Use technology to find a quadratic, exponential, logarithmic, or power function that models a relationship for a bivariate data set to make predictions.	<ul style="list-style-type: none"> <li>Use technology to find a quadratic, exponential, logarithmic, and power function regression equations that models a bivariate data set.</li> <li>Make predictions using regression equations.</li> </ul>	<ul style="list-style-type: none"> <li>Teacher observations</li> <li>Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>Bivariate data</li> <li>Regressions equations</li> </ul>	Important

CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCABULARY	PRIORITY
<b>SEQUENCES AND SERIES</b>					
<ul style="list-style-type: none"> <li>• RECURSIVE FORMULA</li> </ul>	<b>PC.SS.1:</b> Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	<ul style="list-style-type: none"> <li>• Recognize and define recursive sequences as a function.</li> </ul>	<ul style="list-style-type: none"> <li>• Class discussion</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Recursive formula</li> </ul>	Critical
<ul style="list-style-type: none"> <li>• ARITHMETIC SEQUENCE</li> <li>• GEOMETRIC SEQUENCE</li> <li>• EXPLICIT FORMULAS</li> </ul>	<b>PC.SS.2:</b> Write arithmetic and geometric sequences both recursively and with an explicit formula; use them to model situations and translate between the two forms.	<ul style="list-style-type: none"> <li>• Represent arithmetic sequences with both explicit and recursive formulas.</li> <li>• Represent geometric sequences with both explicit and recursive formulas.</li> </ul>	<ul style="list-style-type: none"> <li>• Class discussion</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Arithmetic Sequence</li> <li>• Geometric Sequence</li> <li>• Explicit formula</li> </ul>	Critical
<ul style="list-style-type: none"> <li>• PARTIAL SUMS</li> <li>• SIGMA NOTATION</li> </ul>	<b>PC.SS.3:</b> Find partial sums of arithmetic and geometric series and represent them using sigma notation.	<ul style="list-style-type: none"> <li>• Find partial sums of arithmetic and geometric sequences.</li> <li>• Understand and use sigma notation.</li> </ul>	<ul style="list-style-type: none"> <li>• Class discussion</li> <li>• Quiz/Test</li> </ul>	<ul style="list-style-type: none"> <li>• Partial sums</li> <li>• Sigma notation</li> </ul>	Critical
	<b>PC.SS.4:</b> Model and solve real-world problems involving applications of sequences and series, interpret the solutions and determine whether the solutions are reasonable.	<ul style="list-style-type: none"> <li>• Solve real-world problems involving sequences and series.</li> <li>• Determine if solutions to such problems are reasonable.</li> </ul>	<ul style="list-style-type: none"> <li>• Class discussion</li> <li>• Quiz/Test</li> </ul>		Important

CONTENT	STANDARD INDICATORS	SKILLS	ASSESSMENT	VOCABULARY	PRIORITY
<b>CONICS</b>					
<ul style="list-style-type: none"> <li>• FOCUS</li> <li>• DIRECTRIX</li> </ul>	<b>PC.CO.1:</b> Construct the equation of a parabola given a focus and directrix.	<ul style="list-style-type: none"> <li>• Use the focus and directrix to derive the equation of a parabola.</li> </ul>	<ul style="list-style-type: none"> <li>• Class discussion</li> <li>• Test/Quiz</li> </ul>	<ul style="list-style-type: none"> <li>• Focus</li> <li>• Directrix</li> </ul>	Critical
<ul style="list-style-type: none"> <li>• CIRCLE</li> </ul>	<b>PC.CO.2:</b> Construct the equation of a circle of given center and radius. Complete the square to find the center and radius of a circle given by an equation.	<ul style="list-style-type: none"> <li>• Write the equations of a circle given the center and radius.</li> <li>• Complete the square to find the center and radius of a circle.</li> </ul>	<ul style="list-style-type: none"> <li>• Test/Quiz</li> </ul>	<ul style="list-style-type: none"> <li>• Pythagorean Theorem</li> <li>• Center</li> <li>• Radius</li> </ul>	Important
<ul style="list-style-type: none"> <li>• ELLIPSE</li> <li>• HYPERBOLA</li> </ul>	<b>PC.CO.3:</b> Construct the equations of ellipses and hyperbolas given at least 2 of the following: foci, vertices, length of an axis, or point on the curve.	<ul style="list-style-type: none"> <li>• Write an equation of an ellipse given different characteristics of the ellipse including foci, vertices, length of an axis, or point on the curve.</li> <li>• Write an equation of a hyperbola given different characteristics of the hyperbola including foci, vertices, length of an axis, or point on the curve.</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher observation</li> <li>• Test/Quiz</li> </ul>	<ul style="list-style-type: none"> <li>• Ellipse</li> <li>• Hyperbola</li> <li>• Foci</li> <li>• Vertices</li> </ul>	Important
<ul style="list-style-type: none"> <li>• CONIC SECTIONS</li> </ul>	<b>PC.CO.4:</b> Graph conic sections. Identify and describe features like center, vertex or vertices, focus or foci, directrix, axis of symmetry, major axis, minor axis, and eccentricity.	<ul style="list-style-type: none"> <li>• Graph parabolas, circles, ellipses and hyperbolas.</li> <li>• Identify center, vertices, foci, directrix, axis of symmetry, major axis, minor axis, and eccentricity of conic sections.</li> </ul>	<ul style="list-style-type: none"> <li>• Student presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Axis of symmetry</li> <li>• Major axis</li> <li>• Minor axis</li> <li>• Eccentricity</li> <li>• Center</li> </ul>	Critical