

# FRANKLIN-SIMPSON HIGH SCHOOL

**Course Name: Pre-Calculus Unit Name: Polynomial and Rational Functions**

**Quality Core Objectives:**

Unit 2 Polynomial and Rational Functions	
B.1. Mathematical Processes	<ul style="list-style-type: none"> <li>a. Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems</li> <li>b. Use a variety of strategies to set up and solve increasingly complex problems</li> <li>c. Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships</li> <li>d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly</li> <li>e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems</li> <li>f. Make mathematical connections among concepts, across disciplines, and in everyday experiences</li> <li>g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, decrease time spent on computations after a skill has been established)</li> <li>h. Apply previously learned algebraic and geometric concepts to more advanced problems</li> </ul>
E.1. Expressions and Equations	<ul style="list-style-type: none"> <li>a. Solve polynomial equations using a variety of methods (e.g., factoring, rational roots theorem)</li> <li>b. Use technology to approximate the real roots of a polynomial equation</li> </ul>
E.2. Functions	<ul style="list-style-type: none"> <li>c. Graph general polynomial functions from given characteristics such as degree, sign of lead coefficient, and roots and their multiplicity</li> <li>d. Find the rational roots, real roots, and complex roots of a polynomial function</li> <li>e. Describe the binomial theorem and Pascal's triangle; use them to expand Polynomials</li> </ul>
F.1. Rational and Radical Expressions, Equations, and Functions	<ul style="list-style-type: none"> <li>b. Graph rational functions using intercepts, symmetry, asymptotes, and removable discontinuities</li> </ul>

**Purpose of the Unit: Graph and Analyze Polynomial and Rational Functions**

**Prerequisites: Intercepts, Transformations of functions**

**Daily Lesson Guide**

<b>Day</b>	<b>Lesson Content and Objectives</b>	<b>Focus Questions</b>	<b>Critical Thinking (High Yield / Literacy /LTF/etc.)</b>	<b>Engagement</b>	<b>Assessment and/or Accommodations</b>
<b>1</b>	<b>Turning Points and End Behavior of Polynomial Functions</b>		<b>Foldable for analyzing polynomials</b>		<b>Pg 188 11-22 all, 45-55, 57-60 all</b>
<b>2</b>	<b>Multiplicity and Real Zeroes</b>		<b>Use white boards for formative assessment</b>		<b>Pg 189 65-81</b>
<b>3</b>	<b>Factoring and Real Zeroes</b>		<b>Examples and non examples of polynomial functions</b>		<b>Look at graphs of polynomial functions. Locate zeroes Review factoring</b>
<b>4</b>	<b>Factoring and Real Zeroes</b>				<b>Pg 189 91-98 all</b>
<b>5</b>	<b>Graphing Polynomial Functions</b>				<b>Pg 232 11-19 odds</b>

6	Graphing Polynomial Functions		Use graphing calculator to verify analysis of polynomial functions		Pg 232 39-55 odds
7	Intermediate Value Thm	What is the sign of the y values when x is ...?			Pg 233 73-77 odds, 79-83
8	Graphing Polynomial Functions		Review – Show how to analyze and graph polynomial functions		
9	Assessment of Polynomial Functions				Assessment
10	Properties of Rational Functions, Domain and Points of Discontinuity		Use foldable to determine steps in analyzing a rational function(back of polynomial foldable)		Pg 200 11-22 all, 29-39 odds
11	Rational Functions Transformations		Review transformations		Pg 201 41-51 odds
12	Horizontal, Vertical and Oblique Asymptotes, Intercepts		Use a physical display to formatively assess whether a rational function has a horizontal or oblique asymptote		Pg 201 45-52 evens Pg 210 7-17 odds
13	Analyze and graph Rational Functions				Pg 210 19-33 odds

14	Crossing a horizontal asymptote		LTF – Rational Functions and their Asymptotes		LTF Sheet
15	Crossing a horizontal asymptote		Think Pair Share LTF Sheet		
16	Review Analyzing and Graphing a Rational Function				Pg 241 23, 26, 27, 29, 33
17					Assessment