

# Polynomial Functions

## Curriculum Expectations

By the end of this course, students will:

- recognize a polynomial expression; recognize the equation of a polynomial function, give reasons why it is a function, and identify linear and quadratic functions as examples of polynomial functions
- compare the numeric, graphical, and algebraic representations of polynomial functions
- describe key features of the graphs of polynomial functions
- distinguish polynomial functions from other functions, and compare/contrast the graphs of various polynomial functions with the graphs of other types of functions
- make connections between a polynomial function given in factored form and the  $x$ -intercepts of its graph, and sketch the graph of a polynomial function given in factored form using its key features
- determine the roles of the parameters  $a$ ,  $b$ ,  $c$ , and  $d$  in functions of the form  $y = a f(b(x - c)) + d$ , and describe these roles in terms of transformations on the graphs of polynomial functions
- determine an equation of a polynomial function that satisfies a given set of conditions using appropriate methods, and recognize that there may be more than one polynomial function that can satisfy a given set of conditions
- determine and compare the properties of even and odd polynomial functions, and determine whether a given polynomial function is even, odd, or neither
- recognize different ways of representing rates of change
- recognize that the rate of change for a function is a comparison of changes in the dependent variable to changes in the independent variable, and distinguish situations in which the rate of change is zero, constant, or changing
- calculate and interpret average and instantaneous rates of change of functions

## Schedule of Topics

Day	Topic	Reading	Homework	Questions?
1	Review of Factoring Techniques	None	Worksheet	
2	Factoring Sums/Differences of Cubes	None	Worksheet	
3	Domain and Range (Interval Notation)	None	Worksheet	
4	Power Functions	§1.1	p.11 #1-7,10,11,14	
5	Characteristics of Polynomial Functions	§1.2	p.26 #1-8,11,13,15	
6	Graphing Polynomial Functions	§1.3	p.39 #1-9,11,15	
7			Worksheet	
8	Transformations	§1.4	p.49 #1-10	
9	Average Rate of Change	§1.5	p.62 #1,5-7,10,11a-d,12	
10	Instantaneous Rate of Change	§1.6	p.71 #1-3,5-9	
11	Unit Review	None	pp.74-79	

## Assessment and Evaluation

Quiz/Test/Task	Date	K	A	T	C

# Skills Checklist

At the end of this strand, I am able to:

- |   |            |           |            |
|---|------------|-----------|------------|
| • factor polynomial expressions using familiar techniques               | [ ] Always | [ ] Often | [ ] Seldom |
| • factor a sum or difference of cubes                                   | [ ] Always | [ ] Often | [ ] Seldom |
| • express the domain and range of a function in interval notation       | [ ] Always | [ ] Often | [ ] Seldom |
| • identify basic properties of power functions                          | [ ] Always | [ ] Often | [ ] Seldom |
| • identify basic properties polynomial functions                        | [ ] Always | [ ] Often | [ ] Seldom |
| • use finite differences to determine a leading coefficient's value     | [ ] Always | [ ] Often | [ ] Seldom |
| • determine end-behaviour of a polynomial function                      | [ ] Always | [ ] Often | [ ] Seldom |
| • determine whether a polynomial function has a max/min value           | [ ] Always | [ ] Often | [ ] Seldom |
| • determine whether a polynomial function has a max/min value           | [ ] Always | [ ] Often | [ ] Seldom |
| • relate the $x$ -intercepts of a polynomial function to its factors    | [ ] Always | [ ] Often | [ ] Seldom |
| • classify the behaviour at an $x$ -intercept based on a factor's order | [ ] Always | [ ] Often | [ ] Seldom |
| • determine any symmetry in a polynomial function                       | [ ] Always | [ ] Often | [ ] Seldom |
| • algebraically show that a function is symmetric                       | [ ] Always | [ ] Often | [ ] Seldom |
| • sketch a polynomial function's graph given in factored form           | [ ] Always | [ ] Often | [ ] Seldom |
| • describe transformations applied to the graph of a polynomial         | [ ] Always | [ ] Often | [ ] Seldom |
| • sketch a polynomial function, given a set of transformations          | [ ] Always | [ ] Often | [ ] Seldom |
| • determine a function's average rate of change over an interval        | [ ] Always | [ ] Often | [ ] Seldom |
| • estimate a function's instantaneous rate of change at a point         | [ ] Always | [ ] Often | [ ] Seldom |

Student Comments

Parent/Guardian Comments

Teacher Comments