1. Identify intervals of increase/decrease, the symmetry, and the domain and range, end behaviours, zeros of .
2. State the parent function and the transformations that were applied. Graph the transformed function.
3. State how the axis of symmetry, the amplitude, the domain and range and the period have changed from the parent fiction.
4. State the parent function and the transformations that were applied. Graph the transformed function.
5. State how the asymptotes, the domain and range, intervals of increase/decrease and end behaviours have changed from the parent function.
6. .
7. Graph the inverse
8. For the inverse, state how the asymptotes, domain and range, intervals of increase/decrease and end behaviours have changed from the original function.
9. Determine if the function is even, odd or neither.
10. A sinusoidal function has an amplitude of 2 units, a period of 180˚, and a maximum at (0, 3). Represent the function with an equation in two different ways.
11. Determine an equation for a quadratic that intersects the x-axis at only 5, 1, and goes through the point (6, -8) and sketch the graph of the function.
12. A parent function is transformed. Given the following information:

 Intervals of increase and

 Point of Discontinuity at

Sketch the graph and determine the equation.

2.1 sketch the graphs of f(x) = sin x and f(x) = cos x for angle measures expressed in radians, and determine and describe some key properties (e.g., period of 2π, amplitude of 1) in terms of radians

determine the amplitude, period, and phase shift of sinusoidal functions whose equations are given in the form f(x) = a sin (k(x – d)) + c or f(x) = acos(k(x – d)) + c, with angles expressed in radians

2.5 sketch graphs of y = a sin (k(x – d)) + c and

y = acos(k(x – d)) + c by applying trans- formations to the graphs of f (x) = sin x and

f (x) = cos x with angles expressed in radians, and state the period, amplitude, and phase shift of the transformed functions

Sample problem: Transform the graph of f(x) = cos x to sketch g(x) = 3 cos (2x) – 1, and state the period, amplitude, and phase shift of each function.

2.6 represent a sinusoidal function with an equation, given its graph or its properties, with angles expressed in radians

Sample problem: A sinusoidal function has an amplitude of 2 units, a period of π, and a maximum at (0, 3). Represent the function with an equation in two different ways.

 recognize a polynomial expression (i.e., a series of terms where each term is the product of a constant and a power of x with a non- negative integral exponent, such as

x3 – 5x2 + 2x – 1); recognize the equation of

a polynomial function, give reasons why it

is a function, and identify linear and quad- ratic functions as examples of polynomial functions

1.3 describe key features of the graphs of poly- nomial functions (e.g., the domain and range, the shape of the graphs, the end behaviour of the functions for very large positive or nega- tive x-values)

Sample problem: Describe and compare the key features of the graphs of the functions f(x)=x, f(x)=x2, f(x)=x3, f(x)=x3 +x2, andf(x)=x3 +x.

determine an equation of a polynomial func- tion that satisfies a given set of conditions (e.g., degree of the polynomial, intercepts, points on the function), using methods appropriate to the situation (e.g., using the x-intercepts of the function; using a trial-and-error process with a graphing calculator or graphing soft- ware; using finite differences), and recognize that there may be more than one polynomial function that can satisfy a given set of condi- tions (e.g., an infinite number of polynomial functions satisfy the condition that they have three given x-intercepts)

Sample problem: Determine an equation for a fifth-degree polynomial function that inter- sects the x-axis at only 5, 1, and –5, and sketch the graph of the function.

mine, through investigation, and compare the properties of even and odd polynomial functions [e.g., symmetry about the y-axis

or the origin; the power of each term; the number of x-intercepts; f (x) = f (– x) or

f (– x) = – f (x)], and determine whether a given polynomial function is even, odd, or neither

Sample problem: Investigate numerically, graphically, and algebraically, with and with- out technology, the conditions under which an even function has an even number of x-intercepts.

2.1 determine, through investigation with and without technology, key features (i.e., vertical and horizontal asymptotes, domain and range, intercepts, positive/negative intervals, increasing/decreasing intervals) of the graphs of rational functions that are the reciprocals of linear and quadratic functions, and make con- nections between the algebraic and graphical representations of these rational functions [e.g.,

make connections between f(x) = 1 x2 – 4

and its graph by using graphing technology and by reasoning that there are vertical asymptotes at x = 2 and x = –2 and a hori- zontal asymptote at y = 0 and that the func- tion maintains the same sign as f(x) = x2 – 4]

Sample problem: Investigate, with technology, the key features of the graphs of families of rational functions of the form

f(x)= 1 andf(x)= 1 , x + n x2 + n

where n is an integer, and make connections