### Chapter 1

* the graph of the reciprocal function has a vertical asymptote at each of zero of the original function.
* intervals of increase on the original function are intervals of decrease on the reciprocal function. And vice versa.
* if the original function is either linear or quadratic, the reciprocal function will always have the horizontal asymptote at .
* A reciprocal function has the same positive/negative intervals as the original function
* if the original function has a local maximum point, the reciprocal function will have a local minimum point at the same x-value. And vice versa.

### Chapter 2

* discontinuity results in a domain or range to not be continuous.
* there are three types of discontinuity in the rational function- vertical and horizontal asymptote, and holes.
  + vertical asymptotes: restriction for the domain; the x-values that resulting in the denominator equals zero
  + horizontal asymptotes: the restriction for the range; there are three cases of horizontal asymptotes
    - case 1 occurs when the numerator has a smaller degree than the denominator. For example, if the denominator has a degree of 1 and the numerator is a constant (except 0), then the horizontal asymptote equals 0.
    - case 2 occurs when the numerator is equal degree with the denominator. In this case, the horizontal asymptote = the leading coefficient of the numerator divided by the leading coefficient of the denominator.
    - case 3 is the oblique asymptote, which occurs when the numerator is one degree higher than the denominator. To find the horizontal asymptote is this case, divide the numerator by the denominator. The quotient is the oblique asymptote.
  + holes: occurs when a factor in the numerator can be cancelled not by an identical factor in the denominator. The factor is the location of a hole in a function. Ex: , since can be cancelled out, the point (-3, y) is the hole in the function. Substitute -3 into the function, making . Thus, (-3, -1) is the hole in the function

### Chapter 3

* you can determine the equation of the vertical asymptote directly by finding the zero of the denominator
* since there are different cases for determining the horizontal asymptote, the students must understand which case does the rational function applies.
* to sketch the graph of a rational function, you can use the domain, x and y-intercepts, vertical and horizontal asymptotes, and positive/negative intervals

### Chapter 4

* the zeros of a rational function are the zeros of the function in the numerator
* reciprocal function, , do not have zeros. It has the horizontal asymptote on the x-axis.
* when solving for word problems that involve rational function, it is important to check whether your answers are admissible

### Chapter 5

* to solve for inequality, rearrange the inequality so that one side is zero. Combine expressions on the other side using the common denominator. Make a table to examine the sign of the simplified expression on the intervals created by the zeros and the vertical asymptotes.

### Chapter 6

* please refer to Unit 2