Math 131: Essentials of Calculus  
Spring 2010 - Review IV

Rational Functions  Appendix A.2: p 673 - 674

Keep denominator (and numerator) in factored form!

* Exercises  Appendix A.2 page 680

Simplify  11 – 15 (find the common denominator)

One to One Functions

1. Definition: A function \( f : A \to B \) is one to one if and only if \( f (x_1) = f (x_2) \) implies \( x_1 = x_2 \); in other words for every element in the range there is a unique element in the domain which is mapped to it.

2. Horizontal Line Test

Inverse functions

1. If \( f : A \to B \) is a one to one function where \( B \) is the range of \( f \), then the inverse function \( f^{-1} : B \to A \) is defined by \( f^{-1}(b) = a \) if and only if \( f (a) = b \)

Finding inverse functions

1. Given the equation \( y = f (x) \) of a one to one function, exchange \( x \)'s and \( y \)'s then algebraically solve for \( y \).

2. Fractional Linear Transformations: functions of the form \( y = \frac{ax+b}{cx+d} \) for constants \( a,b,c \), and \( d \).

* Exercises  Find the inverses for the following functions

1. \( y = 2x - 5 \)
2. \( y = \frac{x - 3}{x + 1} \)
3. \( y = \frac{x + 1}{2 - x} \)
4. \( y = \frac{2 - x}{x + 4} \)
Composition of Functions  
Chapter 1.1: pages 6 - 8

Difference Quotients  
Chapter 1.1: pages 8 - 9

* Exercises  
Ch 1.1 page 10

25 – 32  
find the composite function $f(g(x))$

33 – 38  
find the difference quotient

43 – 50  
find the composite function

Standard Function from Economics:  
Chapter 1.1 pages 5 - 6

Cost, Revenue, Profit, Supply, Demand

* Exercises  
Ch 1.1 page 11

57 – 60  
Find revenue $R(x)$ and profit $P(x)$

Review Quiz #4  Monday – All Questions taken from above