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| **Rational Expressions and Functions (6.1)** | **Math 098** |

Definition: A rational expression is an expression consisting of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Rational expressions can be used to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.





Rik usually takes 3 hours more than Pearl does to process a day’s orders at Liberty Place Photo. If Pearl takes *t* hours to process a day’s orders, the function given by  can be used to determine how long it would take if they worked together.

How long will it take them, working together to complete a day’s orders if Pearl can process the orders alone in 5 hours?

Method: Products of Rational Expressions

To multiply two rational expressions, multiply numerators and multiply denominators:



Multiply 

Review: How do we reduce ?

Similarly, reduce 

What is different between  and ?

Write the function in simplified form. Be careful with the domains

1. 
2. 

Simplify

1. 
2. 

Important: We canNOT cancel over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Simplify

1. 
2. 
3. 
4. 

Method: Quotients of Rational Expressions

To divide two rational expressions, invert the second expression and multiply:



Simplify

1. 

1. 

Simplify  and list all domain restrictions

Let’s explore an example to learn a bit about vertical asymptotes … consider. Use your calculator to generate a graph. Looking at the graph, what happens at ? This is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Consider  and . Find and compare their vertical asymptotes and domains.

Find the vertical asymptote(s) of .