**Arellano University - Malabon**

**School of Computer Science**

**CS 314**

**Lesson 2. Operations on Rational Expressions**

**Day & Time: FRIDAY, 9:00 – 12:00**

**Date : Nov. 4, 2022**

1. **Addition and Subtraction**
2. **To add and subtract rational expressions, if having similar simply add or subtract the numerator and copy the same denominator and express into simplest form if necessary.**
3. **To add and subtract rational expressions having dissimilar, divide each denominator by same factor.**

**Examples.**

1. **x2 – 1 + 2x + 3x**

**x2 - 16 x – 4 x + 4**

**LCD: ( x – 4 ) ( x + 4 )**

**x2 – 1 + 2x ( x + 4 ) + 3x ( x – 4 )**

**( x - 4 ) ( x + 4 )**

**x2 – 1 + 2x2 + 8x + 3x2 – 12x**

**( x – 4 ) ( x + 4 )**

**6x2 – 4x – 1**

**( x – 4 ) ( x + 4 )**

1. **11 - 7**

**2x2 + 7x – 15 x2 + 10x + 25**

***11*  - 7**

**( 2x – 3 ) ( x + 5 ) ( x + 5 ) ( x + 5 )**

**LCD: ( 2x – 3 ) ( x + 5 ) ( x + 5 )**

**11 ( x + 5 ) - 7 ( 2x – 3 )**

**( 2x – 3 ) ( x + 5 ) ( x + 5 )**

**11x + 55 – 14x + 21**

**( 2x – 3 ) ( x + 5 ) ( x + 5 )**

**-3x + 55**

**( 2x – 3 ) ( x + 5 )2**

1. **8 + 7 - 5**

**x2 – 3x + 2 x2 – 5x + 6 x2 – 4**

**( x – 2 ) ( x – 1 ) ( x – 2 ) ( x – 3 ) ( x – 2 ) ( x + 2 )**

**LCD: ( x – 2 ) ( x – 1 ) ( x – 3 ) ( x + 2 )**

**8 ( x – 3 ) ( x + 2 ) + 7 ( x – 1 ) ( x + 2 ) – 5 ( x – 1 ) ( x – 3 )**

**( x – 2 ) ( x – 1 ) ( x – 3 ) ( x + 2 )**

**8 ( x2 – x – 6 ) + 7 ( x2 + x - 2 ) – 5 ( x2 – 4x + 3 )**

**( x – 2 ) ( x – 1 ) ( x – 3 ) ( x + 2 )**

**8x2 – 8x – 48 + 7x2 + 7x – 14 – 5x2 + 20x – 15**

**( x – 2 ) ( x – 1 ) ( x – 3 ) ( x + 2 )**

**10x2 + 19x – 77**

**( x – 2 ) ( x – 1 ) ( x – 3 ) ( x + 2 )**

1. **Multiplication**

**To multiply rational expressions, simply factors the numerator and denominator and apply cancellation.**

1. **2x + 6 x x2 – 4**

**x – 2 x2 + 6x + 9**

**2 ( x + 3 ) x ( x – 2 ) ( x + 2 )**

**x – 2 ( x + 3 ) ( x + 3 )**

**2 ( x + 2 )**

**( x + 3 )**

**2x + 4**

**x + 3**

1. **Division**

**To divide rational expressions, simply get the multiplicative inverse and apply cancellation and express into simplest form if necessary.**

1. **x2 + 4x / x2 – 4**

**2x2 + 9x + 4 2x2 + 5x + 2**

**x ( x + 4 ) / ( x – 2 ) ( x + 2 )**

**( 2x + 1 ) ( x + 4 ) ( 2x + 1 ) ( x + 2 )**

**x ( x + 4 ) x ( 2x + 1 ) ( x + 2 )**

**( 2x + 1 ) ( x + 4 ) ( x – 2 ) ( x + 2 )**

**x ( x + 4 ) ( x + 2 )**

**( x + 4 ) ( x – 2 ) ( x + 2 )**

**x**

**x – 2**