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MATH@TD

MCR3U

Unit 1 – Polynomial and Rational Expressions

Review Topics and thoughts

In this unit we flexed our "algebraic muscles" through simplification of rational expressions.

Polynomial Expressions

- Remember that a polynomial is constructed by adding/subtracting power functions. We prefer to write polynomial expressions in descending order.
- The order of a power function is the value of the exponent for the power function. The order of a polynomial expression is the value of the highest ordered power function in the expression.

  e.g. **Power function**: $y = 3x^6$ (this is an order 6 power function)
  Polynomial expression: $-3x^4 + 2x^3 - 5x^2 + \pi x - 7$ (this is an order 4 polynomial)

- In simplifying polynomial expressions, the main thing here is that we add/subtract **Like Terms (terms with the same order – add/subtract the coefficients)**
  - Keep in mind the distinction between **Term** and **Factor**!

Rational Expressions

- **Restrictions**…**Restrictions**…holy cow **RESTRICTIONS**
- Cancelling…**Factors** are the only things which can be **cancelled**…FACTORS
- Get your **Restrictions BEFORE YOU CANCEL**

Restrictions arise from denominators, unless you are dividing in which case there is one more spot to get a restriction (the numerator of the expression being divided).

e.g.

$\frac{5x^2-25x}{2x^2+x-3}$ (factor where you can)

$= \frac{5x(x-5)}{(2x+3)(x-1)}$ (restrictions are $x \neq -\frac{3}{2}, +1$ – only from the denominator)

Consider:

$\frac{(2x-1)(x+2)}{(x-5)(x+3)} \div \frac{(x-4)}{(x+1)}$ (here we have 4 restrictions: $x \neq 5, -3, -1\ OR\ 4$)