Operations on Polynomials

Addition & Subtraction

To add or subtract polynomials, all you have to do is to *combine like terms*. This means that you have to add or subtract the terms that have matching variables (.

**Remember**: when you subtract a group, everything in the parentheses is being subtracted.

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| **EXAMPLE**  *If you re-order them by* ***degree*** *(or total exponential power), then the like terms will line up. Now, simplify!* | **EXAMPLE**  *Re-write it so that the negative belongs to* ***every term in the group****.*  *Re-order them by* ***degree****, & simplify!* | **EXAMPLE** |
| 1. | 2. | 3. |
| 4. | 5. | 6. |
| 7. | 8. | 9. |

Multiplication

The easiest way to multiply polynomials is to use the box method. Multiply the terms, then add ‘em up.

**Remember**: when you multiply matching bases, the exponents *add together*.

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| **EXAMPLE**   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |  |  |  |  |   *Now, just add ‘em up!* | **EXAMPLE**   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |  |  |  |  | |  |  |  |  | | **EXAMPLE**   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |  |  |  |  | |  |  |  |  | |
| 10. | 11. | 12. |
| 13. | 14. | 15. |
| 16. | 17. | 18. |

Simplifying Rational Polynomials

First, factor out anything you can from the numerator and the denominator.

Second, cancel out any terms that you can *(must be attached by multiplication* ***not addition*** *in order to cancel).*

Finally, if you need to, multiply what’s left back together.

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| **EXAMPLE** | **EXAMPLE** | **EXAMPLE**  *Factor the top. AC = (3)(2) = 6 & B = 7*  *Numbers that mult. to AC & add to B…* |
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