Topic 3.2:

Essential Question:

How do you add, subtract, multiply polynomials?

Explore & Reason

Please complete online.

CONCEPT Summary

Adding, Subtracting, and Multiplying Polynomials

ADD To add polynomials, use the Associative and Commutative Properties to group like terms. Then use the Distributive Property to combine like terms.

$$(2x^2 + 5x - 7) + (3x^2 - 9x + 12)$$
$$= (2x^2 + 3x^2) + (5x - 9x) + (-7 + 12)$$
$$= 5x^2 - 4x + 5$$

SUBTRACT To subtract polynomials, distribute the factor of -1. Then, group and combine like terms.

$$(6x^3 + 2x^2 + 14) - (4x^3 + 4x^2 - 8)$$
$$= 6x^3 + 2x^2 + 14 - 4x^3 - 4x^2 + 8$$
$$= (6x^3 - 4x^3) + (2x^2 - 4x^2) + (14 + 8)$$
$$= 2x^3 - 2x^2 + 22$$

Distribute the factor of -1 to each term.

MULTIPLY To multiply polynomials, use the Distributive Property. Then, group and combine like terms.

$$(x + 5)(3x^2 - 2x + 4)$$
$$= x(3x^2 - 2x + 4) + 5(3x^2 - 2x + 4)$$
$$= 3x^3 - 2x^2 + 4x + 15x^2 - 10x + 20$$
$$= 3x^3 + (-2x^2 + 15x^2) + (4x - 10x) + 20$$
$$= 3x^3 + 13x^2 - 6x + 20$$

Notes:

Examples & Questions

Examples 1

Part A

Q: Why can the Commutative and Associative Properties be applied in the same step?

Part B

Q: If two polynomials are being subtracted, what property must be used?

Examples 2

Part A

Q: When you multiply a binomial (2 terms) and a trinomial (3 terms), what is the maximum number of terms in the product?

Q: What do you notice about the product of two polynomials?

Part B

Q: Does it matter which two binomials you multiply first?

Examples 3

Q: What does mean to say that the set of polynomials is *closed under addition*?

Examples 4

Q: What is the difference between revenue and profit in this example?

Q: Why does the price function need to be multiplied by the number of items sold whereas the cost function does not?

Q: How is the maximum point on the graph related to the nine wind chimes?

Examples 5

Part A

Q: What do the *y*-intercepts represent for each function?

Part B

Q: What restrictions are on the domains of these functions?

Q: How ca you determine a realistic number of items that Carolina and Kiyo can each produce and sell?

Practice and Problem Solving

Complete MathXL for School: Additional Practice (online)

Complete MathXL for School: Enrichment (online)

Challenge: #10, 15, 24, 32 – key will be posted in Power School Learning.

Lesson Quiz 3.2