

Math-3A

Lesson 3-7

Divide Polynomials Using “Box Division”

Division of Polynomials

Box Method

$$(2x^3 + 15x^2 + 27x + 5) \div (2x + 5)$$

Only the upper left and bottom right boxes are known.

	$\underline{x^2}$	$\underline{5x}$	$\underline{1}$
$2x$	$2x^3$	$\underline{10x^2}$	$\underline{2x}$
5	$\underline{5x^2}$	$\underline{25x}$	5

$$15x^2$$

$$27x$$

Diagonals have "like terms"

$$(2x^3 + 15x^2 + 27x + 5) \div (2x + 5) = x^2 + 5x + 1$$

Division of Polynomials

Box Method

$$(3x^5 + 12x^4 + 11x^3 + 2x^2 - 4x - 2) \div (3x^2 - 1)$$

Only the upper left and bottom right boxes are known.

Diagonals have "like terms"

	<u>x^3</u>	<u>$4x^2$</u>	<u>$4x$</u>	<u>2</u>
$3x^2$	$3x^5$	$12x^4$	$12x^3$	$6x^2$
$0x$	$0x^4$	$0x^3$	$0x^2$	$0x$
-1	$-x^3$	$-4x^2$	$-4x$	-2

$12x^4$ $11x^3$ $2x^2$ $-4x$ -2

$$(3x^5 + 12x^4 + 11x^3 + 2x^2 - 4x - 2) \div (3x^2 - 1) = x^3 + 4x^2 + 4x + 2$$

Division with remainders

$$(-x^4 - 5x^3 - 2x^2 + 4x + 1) \div (x + 3)$$

Only the upper left and bottom right boxes are known.

	<u>$-x^3$</u>	<u>$-2x^2$</u>	<u>$4x$</u>	<u>-8</u>
x	$-x^4$	$-2x^3$	$4x^2$	$-8x$
3	$-3x^3$	$-6x^2$	$12x$	-24

Remainder
25

$$\begin{array}{r} 25 \\ \hline x + 3 \end{array}$$

$-x^4 - 5x^3 - 2x^2 + 4x + 1$

Diagonals have “like terms”

$$(-x^4 - 5x^3 - 2x^2 + 4x + 1) \div (x + 3)$$

$$= \left(-x^3 - 2x^2 + 4x - 8 + \frac{25}{x + 3} \right)$$

Divide.

$$x^4 + x^3 - 4x^2 + 2x - 12 \div x - 2$$

Divide.

$$2x^4 + 9x^3 - 8x^2 - 15x \div 2x - 3$$
