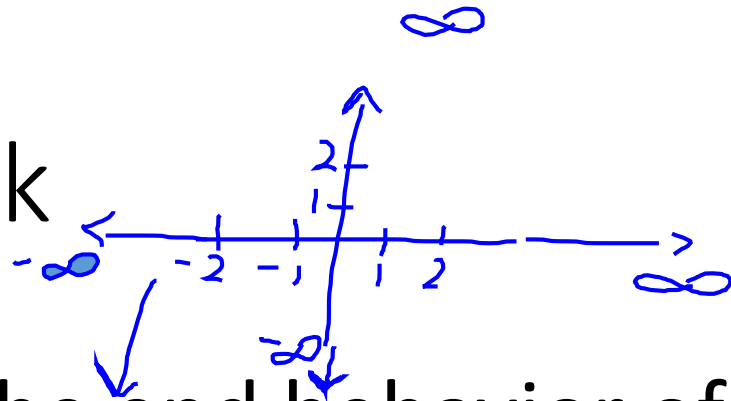


Adding, Subtracting, and Multiplying Polynomials

Lesson 4.2

Bell Work



Describe the end behavior of

$$3x^3 - 6x^2 + 4x - 9$$

Handwritten end behavior for $3x^3 - 6x^2 + 4x - 9$:

$$\begin{array}{l} \leftarrow \text{left} \\ x \rightarrow -\infty \\ y \rightarrow -\infty \end{array} \quad \begin{array}{l} \uparrow \text{right} \\ x \rightarrow \infty \\ y \rightarrow \infty \end{array}$$

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

Handwritten end behavior for $-2x^4 + 4x + 1$ in a box:

$$\begin{array}{ll} x \rightarrow -\infty & x \rightarrow \infty \\ y \rightarrow -\infty & y \rightarrow -\infty \end{array}$$

Arrows labeled "left" and "right" point to the respective columns.



Questions

- Can we add $5x$ and $2x^2$?

- Can we multiply $5x$ and $2x^2$?

Find the sum.

$$(2x^3 + 1x^2 - 3x + 4) + (x^3 + 7x^2 - 2)$$

$$\begin{array}{r} + \quad x^3 + 7x^2 \quad - 2 \\ \hline 3x^3 + 8x^2 - 3x + 2 \end{array}$$

Find the difference.

$$(5x^3 - 4x^2 - 3x + 1) - (3x^3 + 5x^2 - x + 8)$$

$$\begin{array}{r} -3x^3 - 5x^2 + x - 8 \\ \hline 2x^3 - 9x^2 - 2x - 7 \end{array}$$

Multiply $(2x^2 - 3x + 5)(x - 2)$

	$2x^2$	$-3x$	$+5$
x	$2x^3$	$-3x^2$	$5x$
-2	$-4x^2$	$+6x$	-10

$2x^3 - 7x^2 + 11x - 10$

$(x-2)(2x^2-3x+5)$

$$\begin{array}{r} 2x^3 - 3x^2 + 5x \\ -4x^2 + 6x - 10 \\ \hline 2x^3 - 7x^2 + 11x - 10 \end{array}$$

Multiply $(y + 8)(2y^2 - 4y + 3)$

$$2y^2 - 4y + 3$$

y	$2y^3$	$-4y^2$	$+3y$
$+8$	$16y^2$	$-32y$	$+24$

$$2y^3 + 12y^2 - 29y + 24$$

$$(y+8)(2y^2-4y+3)$$

$$\begin{array}{r} 2y^3 - 4y^2 + 3y \\ + \quad \quad \quad + 16y^2 - 32y + 24 \\ \hline 2y^3 + 12y^2 - 29y + 24 \end{array}$$

Multiply $(x + 3)(2x + 1)(2x - 3)$

	$x + 3$	
$2x$	$2x^2$	$6x$
$+1$	x	3

$$2x^2 + 7x + 3$$

$2x$	$4x^3$	$14x^2$	$6x$
-3	$-6x^2$	$-21x$	-9

$$(4x^3 + 8x^2 - 15x - 9)$$

Multiply $(ab + 2)^3$

	$ab + 2$	
ab	a^2b^2	$2ab$
$+ 2$	$2ab$	4

$(ab+2)(ab+2)(ab+2)$

$a^2b^2 + 4ab + 4$

ab			
$+ 2$			