Objectives: You will learn how to use long division to divide polynomials by other polynomials.

Examples:

Divide $6x^3 - 19x^2 + 16x - 4$ by $x - 2$

$$x - 2 \overline{)6x^3 - 19x^2 + 16x - 4}$$

Quotient: $6x^2 - 7x + 2$

$6x^3 - 12x^2$
$-7x^2 + 16x$
$-7x^2 + 14x$
$2x - 4$
$-2x + 4$
0

32
$8 \cdot 4$

Looks similar arithmetic long division. Make sure to list the terms in descending order

Jan 11-9:01 PM

$$23 \overline{)4142} \quad 18 \text{ R}2$$

-23
184
-184
02

$18 \frac{2}{23}$

Feb 20-10:05 AM

Divide $8x^3 - 1$ by $2x - 1$

$$2x - 1 \overline{)8x^3 - 0x^2 + 0x - 1}$$

Quotient: $4x^2 + 2x + 1$

$-8x^3 + 4x^2$
$4x^2 + 0x$
$-4x^2 + 2x$
$2x - 1$
$-2x + 1$

Every term needs to be accounted for. Use the 0 as a place holder for missing terms.

Jan 11-9:03 PM

---

5)

$$n - 2 \overline{)3n^4 - 6n^3 + 0n^2 + 7n - 23}$$

Quotient: $3n^3 + 0n^2 + 0n + 7$

$-3n^4 + 6n^3$
$0n^3 + 7n - 23$
$-7n + 14$
-9

$3n^3 + 7 + \dfrac{-9}{n-2}$

OR

$3n^3 + 7 - \dfrac{9}{n-2}$

Feb 20-10:12 AM