Long Division of Polynomials

What method can I use to divide polynomials?

- let's use area models (inverse of multiplying binomials)

- start from inside out
- first term of polynomial
- divisor goes outside model
- should lose a "variable" each time

Let's practice!

Example #1: $6x^3 - 19x^2 + 16x - 4 \div x - 2$

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

$= 6x^2 - 7x + 2$ no R

$-12x^2 - 7x^2 = -19x^2$

$14x + 2x = 16x$

$-4 + 0 = -4$

Example #2: $x^3-3x^2+8x-5 \div x-1$

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

$-x^2 \underline{-2x^2} = -3x^2$

$+2x \underline{+6x} = 8x$

$-6 \underline{+1} = -5$

?

can't divide by x because that's the last term = 1 is the remainder

$= (x^2-2x+6) + \frac{1}{x-1}$

Example #3: $2x^4-x^3+4 \div x+1$

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

remainder

$2x^3 \underline{-3x^3} = -x^3$

$-3x^2 \underline{+3x^2} = 0$

$3x \underline{-3x} = 0$

no term

$-3 \underline{+7} = 4$

$= (2x^3-3x^2+3x-3) + \frac{7}{x+1}$