

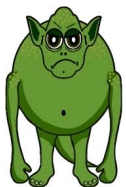
Polynomial Division

Watch the video at <http://goo.gl/A8snov>

Video Problems	Practice Problems
<p>Multiply $(x^2 + 2x - 2)(2x + 3)$ using a rectangle.</p> <div style="border: 1px solid black; width: 300px; height: 100px; margin: 10px 0;"></div>	<p>Multiply $(-3x^3 + 4x^2 - 2x + 1)(x^2 + 3x)$ using a rectangle</p> <div style="border: 1px solid black; width: 300px; height: 100px; margin: 10px 0;"></div>
<p>$\frac{(2x^3+7x^2+2x-6)}{(2x+3)}$</p> <div style="border: 1px solid black; width: 300px; height: 100px; margin: 10px 0;"></div>	<p>Divide: $8x^3 - 1$ by $(2x - 1)$</p> <div style="border: 1px solid black; width: 300px; height: 100px; margin: 10px 0;"></div>
<p>$\frac{2x^2+7x+6}{x+2}$</p> <div style="border: 1px solid black; width: 300px; height: 100px; margin: 10px 0;"></div>	<p>$\frac{2x^4+4x^3-6x^2-8x-192}{x-3}$</p> <div style="border: 1px solid black; width: 300px; height: 100px; margin: 10px 0;"></div>

And finally... the monster problem from the video:

$$\frac{4x^6 - 6x^5 - x^4 + 3x^3 + 4x^2 - 7x + 3}{x^2 - 2x + 1}$$



Some vocabulary: Division lets us write a polynomial function, f , as $f(x) = d(x) \cdot q(x) + r(x)$.

$f(x)$ = dividend

$d(x)$ = divisor

$q(x)$ = quotient

$r(x)$ = remainder

Additional critical points:

- Just like in synthetic/long division, you must insert 0's for any missing terms in both the dividend and divisor
 - Example: Write $x^2 - 2$ as $x^2 + 0x - 2$
- The number of **diagonals** needs to match the number of terms in the dividend (including "0" terms)
- The number of **columns** is one more than the expected degree of the quotient
- On this page, there are **no** remainders. If something doesn't add up, check your math!

Practice Problems: boxes are provided, but **you** need to determine the number of rows and columns!

1. $\frac{3x^3 - 20x^2 + 88x - 105}{3x - 5}$

2. $\frac{8x^3 - 4x^2 - 14x - 5}{2x + 1}$

3. $\frac{x^5 + 3x^4 - 10x^3 - 11x^2 + 24x - 4}{x^2 - 4}$

Don't forget to add the "0" term to the divisor here!

4. Monster problem! $(6x^8 - 9x^7 + 17x^6 + 6x^5 - 14x^4 + 8x^3 - 18x^2 + 37x - 21)$ divided by $(2x^2 - 3x + 7)$

