5-2A Dividing Polynomials

- *dividing a polynomial by a monomial*
- *dividing polynomials using long division*
- *A.APR.6*

Polynomial divided by a monomial.

- rewrite original polynomial as several fractions over the monomial.
- simplify each monomial fraction separately.
- the form $(a + b)(c)^{-1}$ symbolizes division. $(a+b)\left(\frac{1}{c}\right)=\frac{a+b}{c}$

Examples: Divide.

1. $x^3y^2 - x^2y + 2x \div -xy$

$\frac{x^3y^2}{-xy} - \frac{x^2y}{-xy} + \frac{2x}{-xy}$

$-x^2y + x - \frac{2}{y}$

2. $(m^3n^2p - m^2n + n^3p^2 + mp)(mp)^{-1}$

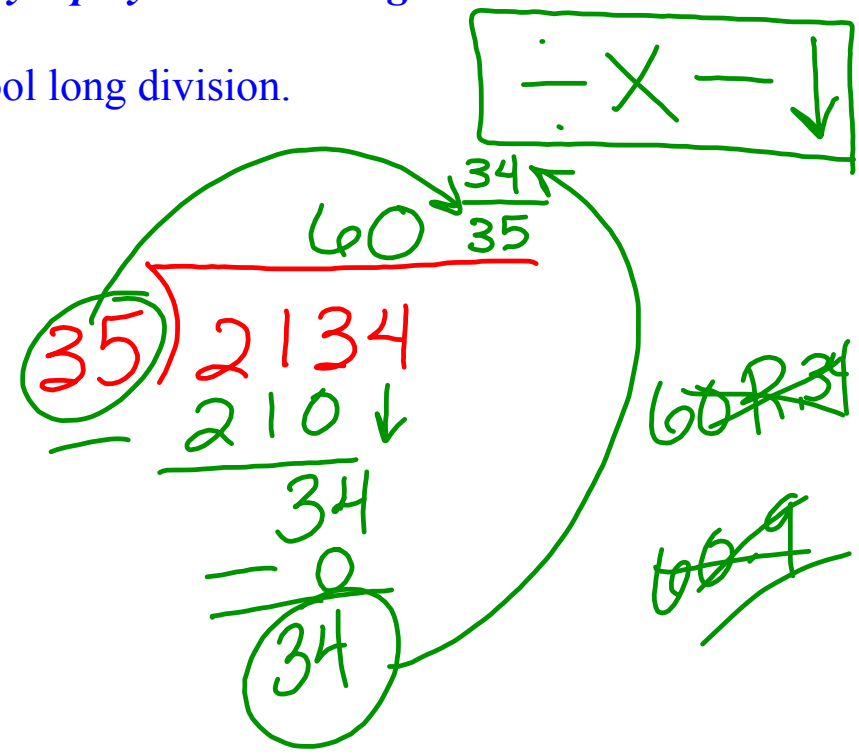
$\frac{m^3n^2p}{mp} - \frac{m^2n}{mp} + \frac{n^3p^2}{mp} + \frac{mp}{mp}$

$m^2n^2 - \frac{mn}{p} + \frac{n^3p}{m} + 1$

Polynomial divided by a polynomial - Long Division

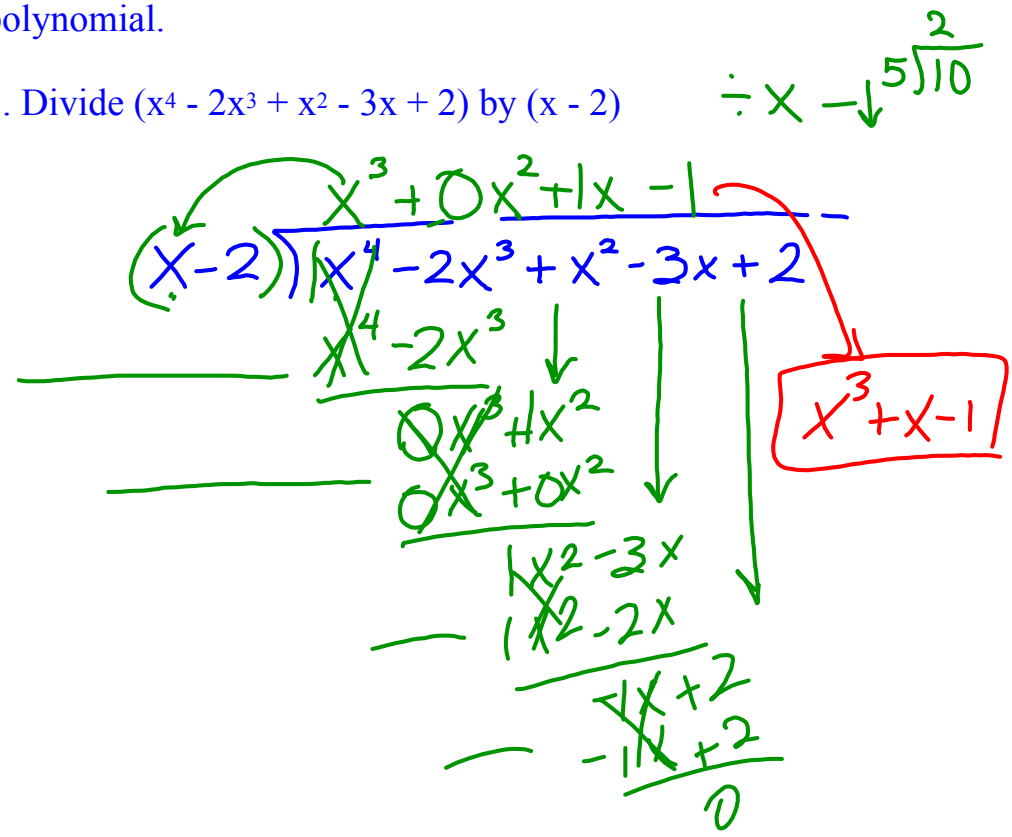
Let's review old school long division.

divide 2134 by 35



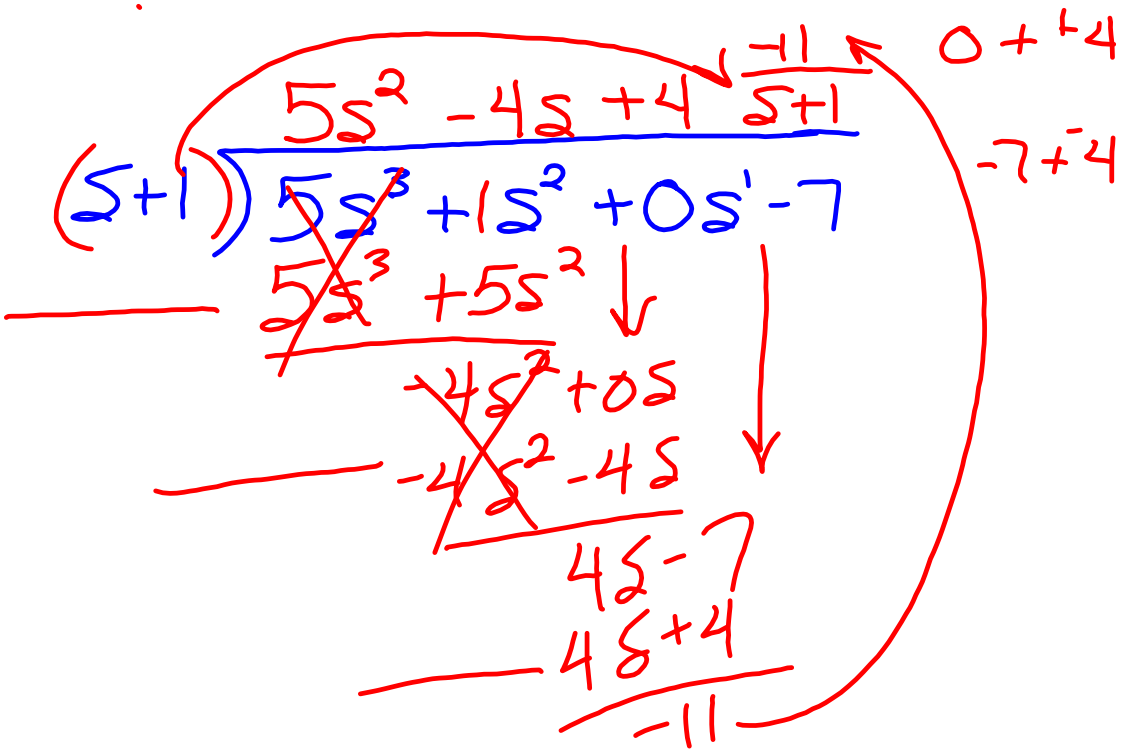
Now let's use the same method to divide a polynomial by another polynomial.

1. Divide $(x^4 - 2x^3 + x^2 - 3x + 2)$ by $(x - 2)$



2. $(5s^3 + s^2 - 7)(s + 1)^{-1}$

missing degrees of the variable

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12-19 all (use division of monomials)
21-31 odd (use long division)
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