

12-6 Dividing Polynomials.....#  
 (Same as before)

**Objective**

Divide a polynomial by a monomial or binomial.

Left page:  $(5x^3 - 10x^2 - 1) \div 5x^3$   
 Divide.  $\frac{5x^3}{5x^3} - \frac{10x^2}{5x^3} - \frac{1}{5x^3}$

$1 - \frac{2}{x} - \frac{1}{5x^3}$

May 1-9:50 AM

Sometimes the divisor is not a factor of the dividend, so the remainder is not 0. Then the remainder can be written as a rational expression.

Divide using long division.

$(3m^2 + 4m - 2) \div (m + 3)$

$\frac{3m - 5 + \frac{13}{m+3}}$

$m+3 \overline{) 3m^2 + 4m - 2}$   
 $\underline{- 3m^2 + 9m}$   
 $-5m - 2$   
 $\underline{+ 5m + 15}$   
 $13$

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Divide using long division.

$(y^2 + 3y + 2) \div (y - 3)$

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Sometimes you need to write a placeholder for a term using a zero coefficient. This is best seen if you write the polynomials in standard form.

May 6-8:26 AM

Divide using long division

$(x^3 - 7 - 4x) \div (x - 3)$

**Remember!** Recall from Chapter 7 that a polynomial in one variable is written in standard form when the degrees of the terms go from greatest to least.

$x^3 - 4x - 7 \div x - 3$

$x^2 + 3x + 5 + \frac{8}{x-3}$

$x-3 \overline{) x^3 + 0x^2 - 4x - 7}$   
 $\underline{- x^3 + 3x^2}$   
 $3x^2 - 4x$   
 $\underline{- 3x^2 + 9x}$   
 $5x - 7$   
 $\underline{- 5x + 15}$   
 $8$

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Divide using long division.

$(1 - 4x^2 + x^3) \div (x - 2)$

Is it in standard form?  
 Do you need a placeholder?

$x^3 - 4x^2 + 0x + 1 \div x - 2$

$x^2 - 2x - 4 - \frac{7}{x-2}$

$x-2 \overline{) x^3 - 4x^2 + 0x + 1}$   
 $\underline{- x^3 + 2x^2}$   
 $-2x^2 + 0x$   
 $\underline{+ 2x^2 - 4x}$   
 $-4x + 1$   
 $\underline{+ 4x - 8}$   
 $-7$

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Standard  
Form?  
Place  
Holder?

Divide using long division.

$$(4p-1+2p^3) \div (p+1)$$

$$2p^2 - 2p + 6 - \frac{7}{p+1}$$

$$\begin{array}{r}
 p+1 \overline{) 2p^3 + 0p^2 + 4p - 1} \\
 \underline{-2p^3 + 2p^2} \phantom{-1} \\
 -2p^2 + 4p \phantom{-1} \\
 \underline{+2p^2 + 2p} \phantom{-1} \\
 6p - 1 \\
 \underline{-6p + 6} \\
 -7
 \end{array}$$

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Assignment:  
12-6 day 3 worksheet

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$$\frac{n^2 + n - 6}{n + 3}$$

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