Algebra II
Sections 6-3
Dividing Polynomials

A look back at numerical long division…

$$15\overline{)65536}$$

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1 EXAMPLE **Polynomial Long Division**

a. Divide $x^2 + 3x - 12$ by $x - 3$.

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1 EXAMPLE **Polynomial Long Division**

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

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3 EXAMPLE **Using Synthetic Division**

Use synthetic division to divide $3x^3 - 4x^2 + 2x - 1$ by $x + 1$.

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3 EXAMPLE **Using Synthetic Division**

Use synthetic division to divide $x^3 + 4x^2 + x - 6$ by $x + 1$.

2 **EXAMPLE** **Checking Factors**

Determine whether $x + 4$ is a factor of each polynomial.

a. $x^2 + 6x + 8$

Do synthetic division!
IF the remainder equals 0, then:
- **(x + 4) is a factor of the polynomial…**
- **…which also means that x = -4 is a zero (or "root", or "x-intercept") of the function .**

2 **EXAMPLE** **Checking Factors**

Determine whether $x + 4$ is a factor of each polynomial.

b. $x^3 + 3x^2 - 6x - 7$

5 **EXAMPLE** **Evaluating a Polynomial by Synthetic Division**

Find $P(-4)$ for $P(x) = x^4 - 5x^2 + 4x + 12$.

Do synthetic division!
In this type of problem, the answer will be <u>the remainder</u>.

5 **EXAMPLE** **Evaluating a Polynomial by Synthetic Division**

Use synthetic division to find $P(-1)$ for
$$P(x) = 2x^4 + 6x^3 - 5x^2 - 60.$$

Homework: Section 6.3

Algebra II   Fourth Six Weeks 2008

Date	Topic	Assignment
January 8/9	6.1 Polynomial Functions	Pg. 315 (15-21 x3, 25-31 all, 33-57 x3, 61-64 all)
	6.2 Polynomials and Linear Factors	Pg. 323 (3-48 x3)
January 10/11	6.3 Dividing Polynomials	Pg. 330 (1-57 odd, 61, 62)
January 14/15	6.4 Solving Polynomial Equations *Quiz 6.1-6.3*	Pg. 336 (13-59 odd, 72, 73)

Also, do #48 and #50 on page 324 (section 6.2)

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