Name: _____ Date: _____

Learning Goal 3.2	Factoring, including the factor theorem and the remainder theorem.

Recall Long Division by dividing 6947 by 52.

Dividend	
Quotient	
Divisor	
Remainder	

Write a division statement that explicitely shows the dividend, the quotient and the remainder **in two ways**.

Example Divide the quadratic polynomial $P(x) = x^2 + 7x + 17$ by the linear polynomial $D(x) = x + 3$. Write a division statement in the following form, stating any restrictions on the variable.

$$\frac{P(x)}{D(x)} = Q(x) + \frac{R}{D(x)}$$

$P(x)$	
$Q(x)$	
$D(x)$	
R	

Example Divide the polynomial $P(x) = 5x^3 + 10x - 13x^2 - 9$ by $x - 2$. Write a division statement and identify any restrictions on the variable.

Example Divide $2x^3 + 3x^2 - 4x + 15$ by $x + 3$ using **synthetic division.**

Example Divide $x^3 + 7x^2 - 3x + 4$ by $x - 2$ using **synthetic division.**

Example Two factors of $12a^4 - 39a^2 + 8a - 8a^3 + 12$ are $a - 2$ and $2a + 1$. Find the other factors.