Synthetic Division
Lesson 17 Part 1
10.26.15
4.3

Remainder Theorem: If a polynomial P(x) is divided by (x-r), the remainder is a constant P(r), and $P(x) = (x - r) \cdot Q(x) + P(r)$, where $Q(x$)is a polynomial with degree one less than the degree of P(x)

$$\frac{x^2 - 4}{x + 2} =$$

Factor Theorem: The binomial x-r is a factor of P(x) if and only if P(r)=0.

I do:

$$Divide\ x^3 + 4x^2 - 5\ by\ (x + 3)$$

Find r in $(x - r)$	$x + 3 = x - r$ $3 = -r$ $r = -3$
Setup the coefficients. Don't forget the 0 coefficients	
Bring down first coefficient Multiply by r Add Repeat until finished	

A depressed polynomial is the resulting quotient of a division operation of a polynomial.

We Try:

$$x^2 + 20x + 91\ divide\ by\ (x + 7)$$

Find r in $(x - r)$	
Setup the coefficients. Don't forget the 0 coefficients	
Bring down first coefficient Multiply by r Add Repeat until finished	

You Try with your partners on the whiteboards:
Left Talk, Right Write

$(x^3 + x^2 - 4x - 4)\ divided\ by\ (x - 2)$

Find r in $(x - r)$	$x + 3 = x - r$ $3 = -r$ $r = -3$
Setup the coefficients. Don't forget the 0 coefficients	
Bring down first coefficient Multiply by r Add Repeat until finished	

You Try with your partners on the whiteboards:
Right Talk, Left Write
$(2x^3 - 3x^2 + x)\ divded\ by\ (x - 1)$

Find r in $(x - r)$	$x + 3 = x - r$ $3 = -r$ $r = -3$
Setup the coefficients. Don't forget the 0 coefficients	
Bring down first coefficient Multiply by r Add Repeat until finished	

Find the remainder and state whether the binomial is a factor of the polynomial:

$x^3 + 4x^2 - x - 4 \; and \; (x - 2)$

Divide by synthetic division	
If the remainder is 0, it is a factor.	