Algebra 2 5.6

Use synthetic substitution to evaluate polynomials
Determine whether a binomial is a factor
Determine factors of polynomials

remainder theorem
synthetic substitution
depressed polynomial
factor theorem
whiteboards

Quiz Fri. 5.5-5.6

Use synthetic substitution

1B. If $g(x) = 4x^5 + 2x^3 + x^2 - 1$, find $f(-1)$.

$$\begin{array}{r|cccccc} -1 & 4 & 0 & 2 & 1 & 0 & -1 \\ & \downarrow & -4 & 4 & -6 & 5 & -5 \\ \hline & 4 & -4 & 6 & -5 & 5 & -6 \end{array}$$

$f(-1) = -6$

Whiteboards

GuidedPractice

2. COLLEGE The function $C(x) = 2.46x^3 - 22.37x^2 + 53.81x + 548.24$ can be used to approximate the number, in thousands, of international college students studying in the United States x years since 2000. How many international college students can be expected to study in the U.S. in 2015?

4,624,640

$f(15)$

15 | 2.46 | −22.37 | 53.81 | 548.24

↓ 36.9

2.46 | 14.53 | 4624.64

GuidedPractice If it is a factor, what must be true?

3. Show that $x - 2$ is a factor of $x^3 - 7x^2 + 4x + 12$. Then find the remaining factors of the polynomial.

$$\begin{array}{r|rrrr} 2 & 1 & -7 & 4 & 12 \\ & \downarrow & 2 & -10 & -12 \\ \hline & 1 & -5 & -6 & 0 \end{array}$$

$x^2 - 5x - 6$

$-6 \times 1 = -6$, $-6 + 1 = -5$

$(x-6)(x+1)(x-2)$

4. $x^3 - 6x^2 + 11x - 6; x - 1$

5. $x^3 + x^2 - 16x - 16; x + 1$

6. $3x^3 + 10x^2 - x - 12; x - 1$