Journal Enrty:

Describe how to factor polynomials based on how many terms it has.

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Section 5-4 continued

Dividing Using Synthetic Division

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When using synthetic division, you will use the coefficients when dividing by x - a.

-Write the coefficients (including zeros) of the polynomial in standard form (omit variables and exponents)
-for the divisor, reverse the sign (use a)
    -allows you to add instead of subtract

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Divide using synthetic division.

$4x^3 - 3x^2 + 2x - 3$ by x - 1

$$\begin{array}{c|cccc} 1 & 4 & -3 & 2 & -3 \\ & & 4 & 1 & 3 \\ \hline & 4 & 1 & 3 & 0 \end{array}$$

$$4x^2 + x + 3$$
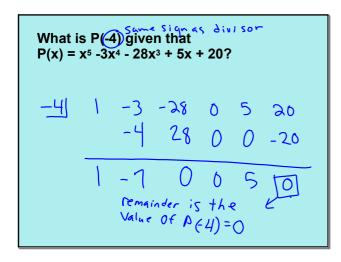
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Use synthetic division to divide
$x^3 - 57x + 56$ by x - 7

$$\begin{array}{c|cccc} 7 & 1 & 0 & -57 & 56 \\ & & 7 & 49 & -56 \\ \hline & 1 & 7 & -8 & 0 \end{array}$$

$$x^2 + 7x - 8$$

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The polynomial $x^3 + 9x^2 + 23x + 15$ expresses the volume, in cubic inches, of a box, and the length is (x + 5) inches. What are the 2 other dimensions of the box?

$V = lwh$ (x+5)(x)

$$\begin{array}{c|cccc} -5 & 1 & 9 & 23 & 15 \\ & & -5 & -20 & -15 \\ \hline & 1 & 4 & 3 & 0 \end{array}$$

$$(x^2 + 4x + 3)(x + 5)$$
$$\boxed{(x + 1)(x + 3)}(x + 5)$$

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What is P(-4) given that *Same sign as divisor*

$P(x) = x^5 - 3x^4 - 28x^3 + 5x + 20$?

$$\begin{array}{r|rrrrrr}
-4 & 1 & -3 & -28 & 0 & 5 & 20 \\
  &   & -4 & 28 & 0 & 0 & -20 \\
\hline
  & 1 & -7 & 0 & 0 & 5 & \boxed{0}
\end{array}$$

remainder is the
value of $P(-4) = 0$

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Hwk: pg. 308 - 309
#22 - 42 (4th), 44 - 54 (evens), 60

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