Section 6.5: cont'd

Wednesday, November 13, 2013
9:48 AM

synthetic division (optional!)

$$
\begin{array}{r}
x^2 + 4x + 13 \\
x-4 \overline{)\, x^3 + 0x^2 - 3x - 7} \\
\underline{x^3 - 4x^2} \\
4x^2 - 3x \\
\underline{4x^2 - 16x} \\
13x - 7 \\
\underline{13x - 52} \\
45
\end{array}
$$

$$
\begin{array}{r|cccc}
4 & 1 & 0 & -3 & -7 \\
 & & 4 & 16 & 52 \\
\hline
 & 1 & 4 & 13 & 45
\end{array}
$$

remainder

$x^2 + 4x + 13$
quotient

quotient: $x^2+4x+13$
remainder: 45

---

example:

$$\frac{x^6-1}{x+1}$$ give quotient and remainder

$$
\begin{array}{r|ccccccc}
-1 & 1 & 0 & 0 & 0 & 0 & 0 & -1 \\
 & & -1 & 1 & -1 & 1 & -1 & 1 \\
\hline
 & 1 & -1 & 1 & -1 & 1 & -1 & \boxed{0}
\end{array}
$$

quotient: $x^5 - x^4 + x^3 - x^2 + x - 1$
remainder: 0

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note: omit the Remainder Theorem