

$$24. \quad \frac{x^3 - 27}{x - 3}$$

$$\begin{array}{r} \underline{x-3} \overline{) x^3 + 0x^2 + 0x - 27} \\ \underline{-(x^3 - 3x^2)} \\ 3x^2 + 0x \\ \underline{-(3x^2 - 9x)} \\ 9x - 27 \\ \underline{-(9x - 27)} \\ 0 \end{array}$$

$x^2 + 3x + 9$

7.4 Dividing Polynomials

- ① Heart method
- ② Long Division
- ③ Synthetic division: only works if the divisor is in the form $x-k$.

Ex: $(x^3 + 3x^2 - 4x - 10) \div (x - 2)$

$$\begin{array}{r|rrrr} 2 & 1 & 3 & -4 & -10 \\ & \downarrow & & & \\ & 2 & 10 & 12 & \\ \hline & 1 & 5 & 6 & 2 \end{array}$$

$x^2 + 5x + 6 + \frac{2}{x-2}$

$$\frac{x^3 + 3x^2 - 1}{x + 4}$$

$$\begin{array}{r|rrrr} -4 & 1 & 3 & 0 & -1 \\ & \downarrow & -4 & 4 & -16 \\ \hline & 1 & -1 & 4 & -17 \end{array}$$

$$x^2 - x + 4 + \frac{-17}{x+4}$$

p. 463

42-70 even, skip 56,
odds extra credit