

6.7

# POLYNOMIAL LONG DIVISION

Review

$$\frac{15}{7} = 2\frac{1}{7}$$

$$\frac{433}{27} \quad 27 \overline{)433}$$

Divide

$$1) \frac{x^2 + 8x + 15}{x + 5} \rightarrow x + 5 \overline{)x^2 + 8x + 15}$$

Divide

$$2) \frac{y^2 - 2y + 5}{y + 1} \rightarrow y + 1 \overline{)y^2 - 2y + 5}$$

## Divide

$$\begin{aligned} 3) \quad & \frac{13x - 35 + 12x^2}{3x + 7} \\ & = \frac{12x^2 + 13x - 35}{3x + 7} \rightarrow 3x + 7 \overline{)12x^2 + 13x - 35} \end{aligned}$$

## Divide

$$4) \quad \frac{n^3 - 2n^2 + n + 2}{n + 2} \rightarrow n + 2 \overline{)n^3 - 2n^2 + n + 2}$$

## Observation

Notice that the degree (exponents) of the following decreases gradually by one.

$$3x^2 - 10x - 8$$

$$2x^3 - 4x^2 + 7x - 6$$

## Using Placeholders...

Notice that the degree (exponents) of the following DOESN'T decrease gradually by one.

$$2a^3 + 5$$

What can we do to fix this?

We put placeholders in it like the following:

$$2a^3 + 0a^2 + 0a + 5$$

Divide

$$5) \frac{2a^3+5}{a-2} \rightarrow a-2 \overline{) 2a^3 + 0a^2 + 0a + 5}$$