**3.2 – THE REMAINDER THEOREM**

To divide polynomials, you can use long division or synthetic division.

**Examples of LONG DIVISION:**



1. $\frac{5x^{3}-13x^{2}+10x-9}{x-2}$
2. $\frac{x^{3}+2x^{2}-5x-6}{x+1}$

Your turn p 121

**Examples of SYNTHETIC DIVISION:**

1. $\frac{5x^{3}-13x^{2}+10x-9}{x-2}$
2. $\frac{2x^{3}+3x^{2}-4x+15}{x+3}$
3. $\frac{4x^{3}-5x+1}{x-2}$

Your turn p 122:



If you divide a Polynomial $P(x)$ by $(x-a)$, then the remainder is $P(a)$.

**The REMAINDER THEOREM**:

Example 1: $P\left(x\right)=5x^{3}-13x^{2}+10x-9$ divided by $x-2$

Example 2: $P\left(x\right)=2x^{3}+3x^{2}-4x+15$ divided by $x+3$

Your turn: $\frac{x^{3}+2x^{2}-5x-6}{x-2}$ and $\frac{x^{3}-10x+6}{x+4}$

**Hwk: p 124 # 3 – 15 + 16**