

## 2.5 - Remainder Theorem

◦ If a polynomial  $P(x)$  is divided by  $x-a$ , then the remainder is  $P(a)$

\* If the remainder = 0, then  $a$  is a factor!

◦ Ex 1) Determine the remainder for

$$(4x^2 - 2x + 7) \div (x-1)$$

$$x-1=0$$

$$+1 \quad +1$$

$$x=1$$

$$4(1)^2 - 2(1) + 7 = \boxed{9}$$

Not a factor!

◦ Ex 2) find the remainder for

$$(8x^3 + 6x^2 + 9) \div (x+3)$$

$$x+3=0$$

$$-3 \quad -3$$

$$x=-3$$

$$8(-3)^3 + 6(-3)^2 + 9 = \boxed{-153}$$

Not a factor

◦ Ex 3)  $(x^2 - 1) \div (x+1)$

$$x+1=0$$

$$-1 \quad -1$$

$$x=-1$$

$$(-1)^2 - 1 = \boxed{0}$$

factor!