

If  $a^7b, a^4b^2, a^5b^3, \dots$

$$r = \frac{a^4b^2}{a^7b} = \frac{b}{a}$$

$$u_n = u_1 (r)^{n-1}$$

$$u_7 = a^7b \left(\frac{b}{a}\right)^6$$

$$= \frac{a^7b}{\underset{1}{a} \underset{1}{a} \underset{1}{a} \underset{1}{a} \underset{1}{a} \underset{1}{a} \underset{1}{a}} \left(\frac{b^6}{a^6}\right) = \frac{a^7b^7}{a^6}$$

$$= ab^7$$

E

$$u_3 = u_1 r^2$$

$$9r^2 = 144$$

$$r^2 = 16$$

$$r = \pm 4$$

if +4

$$\begin{aligned} u_2 &= 9(4) \\ &= 36 \end{aligned}$$

if -4

$$\begin{aligned} u_2 &= 9(-4) \\ &= -36 \end{aligned}$$

## 6.4 Sigma Notation and series

new symbol

sigma

$n$

stopping point  
upper limit of  
summation

Summation  
sign

$x_i$  - typical  
element

$i = 1$   
index of  
summation

starting point  
lower limit of  
summation

A sequence is a list of numbers, in order, according to a rule

$$u_1, u_2, u_3, \dots$$

A series is the summation of the terms of a sequence

$\sum_{i=1}^n x_i$  means: the sum of the first  $n$  terms of a sequence

Ex] a. Write the expression  $\sum_{i=1}^4 (x^2 - 3)$  as a sum of terms.

$$\sum_{i=1}^4 (x^2 - 3) = (1^2 - 3) + (2^2 - 3) + (3^2 - 3) + (4^2 - 3)$$

b. Find the sum =  $-2 + 1 + 6 + 13 = 18$

Ex 2) Evaluate  $\sum_{m=1}^7 (m^2) = (1)^2 + (2)^2 + (3)^2 + (4)^2 + (5)^2 + (6)^2 + (7)^2$

$$= 1 + 4 + 9 + 16 + 25 + 36 + 49$$

$$= 140$$

Ex 1) write the series  $240 + 120 + 60 + 30 + 15 + 7.5$  using sigma notation

$$\sum_{i=1}^6 240 \left(\frac{1}{2}\right)^{i-1}$$

$$r = \frac{1}{2}$$

$$u_1 = 240$$

$$u_n = u_1 (r)^{n-1}$$

$$240 \left(\frac{1}{2}\right)^{1-1} + 240 \left(\frac{1}{2}\right)^{2-1}$$

Hw 6 F p. 171 #1-3