If $a^7b, a^6b^2, a^5b^3, \ldots$

$$r = \frac{a^6b^2}{a^7b} = \frac{b}{a}$$

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

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

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

$$= ab^7$$

E

$u_3 = u_1 r^2$

$9r^2 = 144$

$r^2 = 16$

$r = \pm 4$

if $+4$

$u_2 = 9(4)$

$= 36$

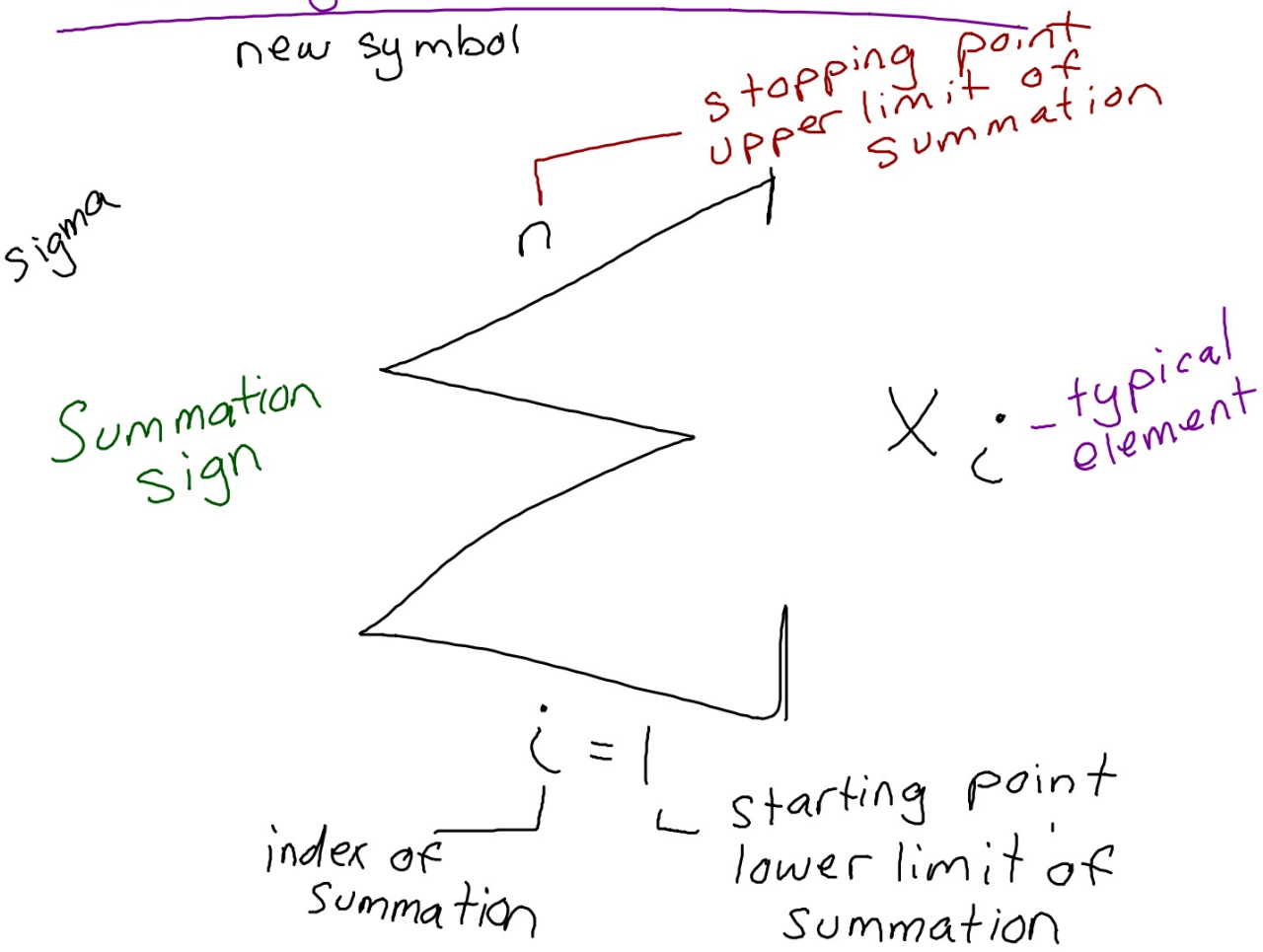
if -4

$u_2 = 9(-4)$

$= -36$

6.4 Sigma Notation and Series

new symbol



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

$u_1, u_2, u_3, \ldots$

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 $= -2 + 1 + 6 + 13 = 18$

Ex2) 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) write the series $240+120+60+30+15+7.5$ using sigma notation

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

$u_1 = 240$

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

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

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

$i=1 \qquad i=2$

Hw 6F p. 171 #1-3