$m, 13, 3m-6$

$u_1 = m$

$u_2 = m + d = 13$

$u_3 = m + 2d = 3m-6$

$d = 13 - m$

$m + 2(13-m) = 3m-6$

$m + 26 - 2m = 3m-6$

$-m + 26 = 3m-6$

$32 = 4m$

$8 = m$

$\frac{m+3m-4}{2} = 13$

$m+3m-4 = 26$

$4m = 32$

$m = 8$

6.3 Geometric Sequences

In a geometric sequence, each term can be obtained by multiplying the previous term by a constant value. This value is called the common ratio, or *r*.

r can be +, − or a fraction

Ex) 1, 5, 25, 125, ... $u_1 = 1$, $r = 5$

$n = 0 \quad 5^1 \quad 5^2$

$u_n = 5^0 \quad 5 \quad 25$

Ex) $K, K^2, K^3, K^4, \ldots$ $u_1 = K$ $r = K$

find the common ratio for:

$2, 6, 18, 54, \ldots$ $r = 3$

$-4, 2, -1, \frac{1}{2}, \ldots$ $r = -\frac{1}{2}$

Formula for Relationship (in Days)

Formula	Joyce ($n=0$)	Leslie ($n=1$)	Penny ($n=2$)	Stephanie ($n=3$)
Actual values	27	2	$\frac{3}{24}=.125$	0.0139
$y=\frac{27}{12^n}$	$\frac{27}{1}$	$\frac{27}{12}=2.25$	$\frac{27}{12^2}$ 0.1875	0.015625
$y=\frac{27}{129^n}$	27	2.09	0.162	0.01257

$$\frac{13.5+16+9.208}{3}=12.9$$

for any geometric sequence $u_{n+1} = (u_n)r$ you can find any term of the sequence by multiplying the previous term by the common ratio r.

For any geo sequnce

$u_1 =$ 1st term

$u_2 = u_1 \times r$

$u_3 = u_2 \times r = (u_1 \times r) \times r = u_1 \times r^2$

$\vdots$

nth term $u_n = u_1 \times r^{(n-1)}$

Ex 1) find the 9th term of $1, 4, 16, 64, \ldots$

$u_1 = 1$

$r = 4$

$u_9 = (1) \cdot 4^{(9-1)} = 4^8 =$

$= 65536$

Ex 2) in a geo sequence $u_1 = 864$ and $u_4 = 256$. Find the common ratio r

$$u_4 = u_1 \times r^3$$

$$256 = 864 \cdot r^3$$

$$\frac{256}{864} = r^3$$

$$\frac{8}{27} = r^3$$

$$\frac{2\sqrt{2}}{3\sqrt{3}} = r$$

$$\frac{2}{3} = r$$

Htw 6D p. 168 #1

Htw 6E p. 169 #1-3