$\{17,26,35,44\}$

Next three terms $\{17,26,35,44,53,62,71\}$

Note: $26-17=9$

$35-26=9$

$44-35=9$

This means that this sequence can be written as an arithmetic sequence

d = 9

$a_1=17$

Arithmetic Sequence $a_n=a_1+(n-1)d$

$=17+(n-1)(9)$

Explicit Form of this Sequence

$a_n=17+9n-9$

$a_n=8+9n$

		B seq_11
=		
1	7	17
2	6	26
3	5	35
4	4	44
5		53
6		62
7		71
8		
9		
10		
11		

B6:B7

finding a_{100} given that $a_n = 17 + (n-1)(9)$

$$a_{100} = 17 + (100-1)(9)$$

$$= 908$$

finding a_{100} given that $a_n = 8 + 9n$

$$a_{100} = 8 + (9)(100)$$

$$= 908$$

now you CAN write an arithmetic sequence as a recursive sequence, but arithmetic is easier!

$a_1 = 17$

$a_{n+1} = a_n + 9$

$\{1296, 216, 36, 6\}$ Including the next three terms $\left\{1296, 216, 36, 6, 1, \frac{1}{6}, \frac{1}{36}\right\}$

Note: $\frac{216}{1296} = \frac{1}{6}$ $\quad \frac{36}{216} = \frac{1}{6}$ $\quad \frac{6}{36} = \frac{1}{6}$

This means that this sequence can be written as a geometric sequence

$r = \frac{1}{6}$ $\quad a_1 = 1296$ $\quad$ Geometric Sequence $a_n = a_1 \cdot r^{n-1}$

$$= 1296 \cdot \left(\frac{1}{6}\right)^{n-1}$$

Explicit Form of this Sequence

$$a_n = 1296 \cdot \left(\frac{1}{6}\right)^{n-1}$$

$$a_n = 6^4 \cdot \left(6^{-1}\right)^{n-1}$$

$$= 6^4 \cdot \left(6^{-n+1}\right)$$

$$= 6^{-n+5} = 7776 \cdot 6^{-n}$$

	_1
=	
1	1296
2	216
3	36
4	6
5	
6	
7	
8	
9	
10	
11	

8

finding a_9 given that $a_n=1296\left(\frac{1}{6}\right)^{n-1}$

$$a_9=1296\left(\frac{1}{6}\right)^{9-1}$$

$$=1296\left(\frac{1}{6}\right)^{8}$$

$$=\frac{1296}{1679616}=\frac{1}{1296}$$

now you CAN write an geometric sequence as a recursive sequence, but geometic is easier!

$$a_1 = 1296$$

$$a_{n+1} = \frac{1}{6} a_n$$

$$\left\{\frac{1}{5},\frac{-1}{25},\frac{1}{125},\frac{-1}{625}\right\}$$

Including the next three terms $\left\{\frac{1}{5},\frac{-1}{25},\frac{1}{125},\frac{-1}{625},\frac{1}{3125},\frac{-1}{15625},\frac{1}{78125}\right\}$

Note: $\frac{\frac{-1}{25}}{\frac{1}{5}}=\frac{-1}{5}$ $\frac{\frac{1}{125}}{\frac{-1}{25}}=\frac{-1}{5}$ $\frac{\frac{-1}{625}}{\frac{1}{125}}=\frac{-1}{5}$

This means that this sequence can be written as a geometric sequence

$r=\frac{-1}{5}$ $a_1=\frac{1}{5}$ Geometric Sequence $a_n=a_1\cdot r^{n-1}$

$$=\frac{1}{5}\cdot\left(\frac{-1}{5}\right)^{n-1}$$

	A seq_1	B
=		
1	1/5	
2	-1/25	
3	1/125	
4	-1/625	
5		
6		-
7		
8		
9		
10		
11		

1

finding a_{10} given that $a_n=\frac{1}{5}\left(\frac{-1}{5}\right)^{n-1}$

$$a_{10}=\frac{1}{5}\left(\frac{-1}{5}\right)^{10-1}$$

$$=\frac{1}{5}\left(\frac{-1}{5}\right)^{9}$$

$$=\frac{-1}{9765625}$$

now you CAN write an geometric sequence as a recursive sequence, but geometic is easier!

$$a_1 = \frac{1}{5}$$

$$a_{n+1} = \frac{-1}{5} a_n$$

Problem 4

$\{15,20,26,33,41\}$ Including the next three terms $\{15,20,26,33,41,50,60,71\}$

Note: $\frac{20}{15}=\frac{4}{3}$ $\frac{26}{20}=\frac{13}{10}$ $\frac{33}{26}=\frac{33}{26}$ $\frac{41}{33}=\frac{41}{33}$

Note: $20-15=5$ $26-20=6$ $33-26=7$ $41-33=8$

So this does not have a common ratio or a common difference

This means that this sequence cannot be written as a geometric or an arithmetic sequence

So we must write a different type of sequence, recursive sequence

$a_1=15$

$a_{n+1}=(n+4)+a_n$ (this means add the number of term plus 4 to the previous term)

	A	B	C	D	E	F	G
=							
3	n	1	2	3	4	5	
4							

A4

=	
1	15
2	20
3	26
4	33
5	41
6	50
7	60
8	71
9	83
10	96
11	110

D7:D11