	A	B	C	D	E	F	G
=							
1	seq_num	value	difference	diff_diff			
2	1	-165	-100	-15			
3	2	-265	-115	-15			
4	3	-380	-130	-15			
5	4	-510	-145				
6	5	-655					
7							
8							
9							
10							
11							

A1 *seq_num*

$\{^-165, ^-265, ^-380, ^-510, ^-655\}$

this sequence is NOT arithmetic nor geometric

this sequence can be written as a recursive pattern

The pattern changes after the second term to an arithmetic pattern

THE PATTERN

So we need to get a sequence to add $^-100$ to its first term and then only and then after that only add $^-15$ to each successive term

$a_1 = {^-165}$ (this is always just stated in a recursive sequence)

$a_2 = {^-265} = {^-165} + [{^-100} + \mathbf{0}({^-15})]$

$a_3 = {^-380} = {^-265} + [{^-100} + \mathbf{1}({^-15})]$

$a_4 = {^-510} = {^-380} + [{^-100} + \mathbf{2}({^-15})]$

$a_5 = {^-655} = {^-510} + [{^-100} + \mathbf{3}({^-15})]$

$a_1 = {}^-165$ (this is always just stated in a recursive sequence)

notice that the highlighted counters are off by 2

$a_2 = {}^-265 = {}^-165 + [{}^-100 + \mathbf{0}({}^-15)]$

$a_3 = {}^-380 = {}^-265 + [{}^-100 + \mathbf{1}({}^-15)]$

$a_4 = {}^-510 = {}^-380 + [{}^-100 + \mathbf{2}({}^-15)]$

$a_5 = {}^-655 = {}^-510 + [{}^-100 + \mathbf{3}({}^-15)]$

$a_1 = {}^{-}165$ (this is always just stated in a recursive sequence)

Since the highlighted counters are off by 2,

lets make that adjustment by subtracting 2 from sequence number, n.

$$a_2 = {}^{-}265 = {}^{-}165 + [{}^{-}100 + \mathbf{(n-2)}({}^{-}15)]$$

$$a_3 = {}^{-}380 = {}^{-}265 + [{}^{-}100 + \mathbf{(n-2)}({}^{-}15)]$$

$$a_4 = {}^{-}510 = {}^{-}380 + [{}^{-}100 + \mathbf{(n-2)}({}^{-}15)]$$

$$a_5 = {}^{-}655 = {}^{-}510 + [{}^{-}100 + \mathbf{(n-2)}({}^{-}15)]$$

$a_1 = {}^-165$ (this is always just stated in a recursive sequence)

Use the pattern to find the next two terms

$a_2 = {}^-265 = {}^-165 + [{}^-100 + (2-2)({}^-15)]$

$a_3 = {}^-380 = {}^-265 + [{}^-100 + (3-2)({}^-15)]$

$a_4 = {}^-510 = {}^-380 + [{}^-100 + (4-2)({}^-15)]$

$a_5 = {}^-655 = {}^-510 + [{}^-100 + (5-2)({}^-15)]$

$a_6 = {}^-815 = {}^-655 + [{}^-100 + (6-2)({}^-15)]$

$a_7 = {}^-990 = {}^-815 + [{}^-100 + (7-2)({}^-15)]$

So now we can write a rule for the sequence $\{^{-}165, ^{-}265, ^{-}380, ^{-}510, ^{-}655\}$

$$a_1 = {}^{-}165$$

$$a_n = a_{n-1} + [{}^{-}100 + (n-2)({}^{-}15)]$$

Now the second part of the rule has an EXPLICIT formula that all versions of this rule must eventually become

$$a_n = a_{n-1} + {}^{-}15 \cdot n - 70$$

	A	B	C	D	E	F	G
=							
1	seq_num	value	difference	diff_diff			
2	1	27	88	16			
3	2	115	104	16			
4	3	219	120	16			
5	4	339	136				
6	5	475					
7							
8							
9							
10							
11							

A1 *seq_num*

$\{27,115,219,339,475\}$

this sequence is NOT arithmetic nor geometric

this sequence can be written as a recursive pattern

The pattern changes after the second term to an arithmetic pattern

THE PATTERN

So we need to get a sequence to add 88 to its first term and then only and then after that only add 16 to each successive term

$a_1=27$ (this is always just stated in a recursive sequence)

$a_2=115=27+[88+\mathbf{0}(16)]$

$a_3=219=115+[88+\mathbf{1}(16)]$

$a_4=339=219+[88+\mathbf{2}(16)]$

$a_5=475=339+[88+\mathbf{3}(16)]$

$a_1 = 27$ (this is always just stated in a recursive sequence)

notice that the highlighted counters are off by 2

$a_2 = 115 = 27 + [88 + \mathbf{0}(16)]$

$a_3 = 219 = 115 + [88 + \mathbf{1}(16)]$

$a_4 = 339 = 219 + [88 + \mathbf{2}(16)]$

$a_5 = 475 = 339 + [88 + \mathbf{3}(16)]$

$a_1 = 27$ (this is always just stated in a recursive sequence)

Since the highlighted counters are off by 2,

lets make that adjustment by subtracting 2 from sequence number, n.

$$a_2 = 115 = 27 + [88 + (n-2)(16)]$$

$$a_3 = 219 = 115 + [88 + (n-2)(16)]$$

$$a_4 = 339 = 219 + [88 + (n-2)(16)]$$

$$a_5 = 475 = 339 + [88 + (n-2)(16)]$$

$a_1 = 27$ (this is always just stated in a recursive sequence)

Use the pattern to find the next two terms

$a_2 = 115 = 27 + [88 + (2-2)(16)]$

$a_3 = 219 = 115 + [88 + (3-2)(16)]$

$a_4 = 339 = 219 + [88 + (4-2)(16)]$

$a_5 = 475 = 339 + [88 + (5-2)(16)]$

$a_6 = 627 = 475 + [88 + (6-2)(16)]$

$a_7 = 795 = 627 + [88 + (7-2)(16)]$

So now we can write a rule for the sequence $\{27,115,219,339,475\}$

$$a_1=27$$

$$a_n=a_{n-1}+[88+(n-2)(16)]$$

Now the second part of the rule has an EXPLICIT formula that all versions of this rule must eventually become

$$a_n=a_{n-1}+16\cdot n+56$$

	A	B	C	D	E	F	G
=							
1	seq_num	value	ratio	diff_ratio			
2	1	8	77	7			
3	2	616	84	7			
4	3	51744	91	7			
5	4	4708704	98				
6	5	461452992					
7							
8							
9							
10							
11							

A1 *seq_num*

$\{8,616,51744,4708704,461452992\}$

this sequence is NOT arithmetic nor geometric

this sequence can be written as a recursive pattern

The pattern changes after the second term to an arithmetic pattern

THE PATTERN

So we need to get a sequence to multiply by 77 to its first term and then only and then after that multiply by 7 more than the previous term to each successive term

$a_1 = 8$ (this is always just stated in a recursive sequence)

$a_2 = 616 = 8\,[77 + \mathbf{0}(7)]$

$a_3 = 51744 = 616\,[77 + \mathbf{1}(7)]$

$a_4 = 4708704 = 51744\,[77 + \mathbf{2}(7)]$

$a_5 = 461452992 = 4708704\,[77 + \mathbf{3}(7)]$

$a_1=8$ (this is always just stated in a recursive sequence)

notice that the highlighted counters are off by 2

$a_2=616=8[77+\mathbf{0}(7)]$

$a_3=51744=616[77+\mathbf{1}(7)]$

$a_4=4708704=51744[77+\mathbf{2}(7)]$

$a_5=461452992=4708704[77+\mathbf{3}(7)]$

$a_1 = 8$ (this is always just stated in a recursive sequence)

Since the highlighted counters are off by 2,

lets make that adjustment by subtracting 2 from sequence number, n.

$$a_2 = 616 = 8[77 + (n-2)(7)]$$

$$a_3 = 51744 = 616[77 + (n-2)(7)]$$

$$a_4 = 4708704 = 51744[77 + (n-2)(7)]$$

$$a_5 = 461452992 = 4708704[77 + (n-2)(7)]$$

$a_1 = 8$ (this is always just stated in a recursive sequence)

Use the pattern to find the next two terms

$$a_2 = 616 = 8 + [77 + (2-2)(7)]$$

$$a_3 = 51744 = 616 + [77 + (3-2)(7)]$$

$$a_4 = 4708704 = 51744 + [77 + (4-2)(7)]$$

$$a_5 = 461452992 = 4708704 + [77 + (5-2)(7)]$$

$$a_6 = 48452564160 = 461452992 + [77 + (6-2)(7)]$$

$$a_7 = 5426687185920 = 48452564160 + [77 + (7-2)(7)]$$

So now we can write a rule for the sequence $\{8,616,51744,4708704,461452992\}$

$$a_1=8$$

$$a_n=a_{n-1}[77+(n-2)(7)]$$

Now the second part of the rule has an EXPLICIT formula that all versions of this rule must eventually become

$$a_n=a_{n-1}[7\cdot n+63]$$