Number Patterns Investigation

Grade 8 Maths

Patterns are everywhere.

1. Give some examples of patterns that you see in everyday life.

We can use patterns to help us predict and plan for the future.

2. What are some of the ways we can use patterns to plan for the future?

3. Given below are some patterns in diagram form. For each pattern explain how the pattern is changing from one picture to the next.

a)

b)

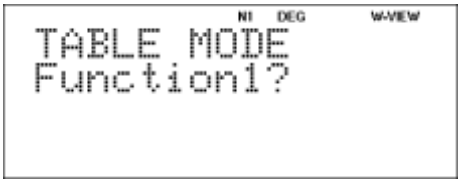
c)

d)

e)

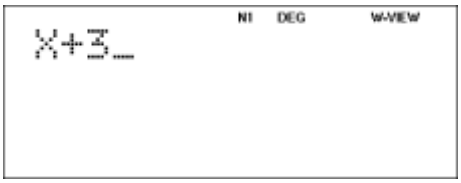
Let's explore patterns on your calculator.

Go to your table mode. (On the Sharp EL-W535SA press CA MODE 2).

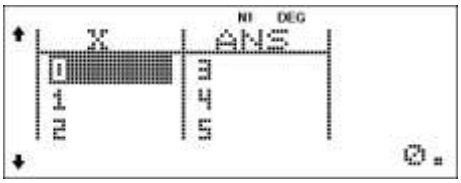


We are going to create a pattern of our own.

Press RCL RCL + 3



Now press = four times (until you reach the table).



4. Using the table on your calculator complete the table given below:

X	Ans
1	
2	
3	
5	
10	
x	

a) What does the x stand for?

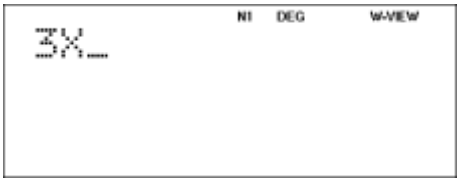
b) What happens to the ANS column as the X changes?

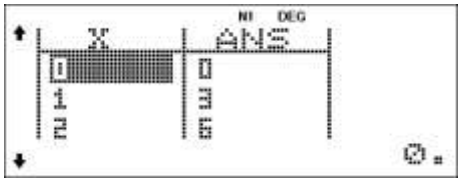
c) What is the pattern?

d) Can you write this pattern algebraically? (Use x for X and y for ANS).

Now we are going make another pattern. Press [OFF ON/C] [OFF ON/C].

Type in [3] [x^3 x RCL] [x^3 x RCL] and press [=] 4 times.





5. Using the table on your calculator complete the table given below:

X	Ans
1	
2	
3	
5	
10	
x	

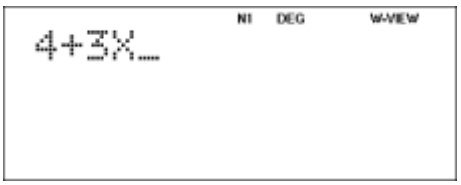
a) What does the x stand for?

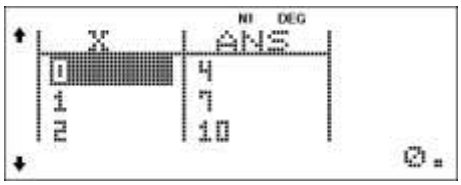
b) What happens to the ANS column as the X changes?

c) What is the pattern?

d) Can you write this pattern algebraically? (Use x for X and y for ANS).

We want to start our pattern at 7, and add 3 every time, so we press [OFF ON/C] [OFF ON/C] and then type in [4] [+] [3] [x^3 x RCL] [x^3 x RCL] and then [=] four times.





6. Using the table on your calculator complete the table given below:

X	Ans
1	
2	
3	
5	
10	
x	

a) What does the x stand for?

b) What happens to the ANS column as the X changes?

c) What is the pattern?

d) Why do we only add 4, if we want to start with a first term of 7?

e) Can you write this pattern algebraically? (Use x for X and y for ANS).

7. From the previous patterns that we have explored, answer the following questions:

a) When we want to add the same number to the previous value in the pattern, how do we write this algebraically?

b) What do we use to represent the term position algebraically?

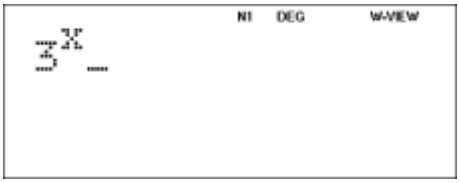
c) What do we use to represent the term value algebraically?

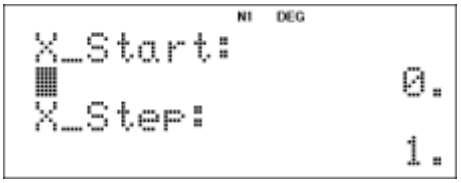
d) Can we start counting patterns from position 0?

e) Which position should we start our patterns from?

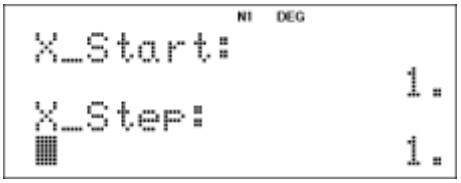
Let's investigate patterns where we have a constant multiplicand:

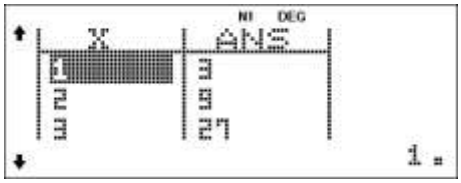
Press ON/C twice. Now type in 3 y^x RCL RCL and then = twice.





Press 1 for Start and press = twice again.





8. Complete the table below:

X	Ans
1	
2	
3	
5	
7	
10	
x	

a) What can we about the relationship between the X and the Ans?

b) Write an algebraic equation to describe this relationship.

9. Using the strategies above, create your own pattern

a) with a common difference

b) with a common multiplicand.