SUM IT UP

Dear parent or guardian: This is a summary of the key ideas your child is learning in mathematics. You can use this summary as background as you support your child's work.

(3) Pattern Rules

What Is a Pattern Rule?

A pattern rule tells someone how to continue a pattern. For example, a pattern rule could be "Start at 4 and add 3 each time." The pattern would be 4, 7, 10, 13, 16, … .

Or a rule could be "Start at 300 and divide by 2 each time." The pattern would be 300, 150, 75, 37.5, 18.75, … .

The numbers in a pattern do not have to be whole numbers.

A New Kind of Pattern Rule

Many pattern rules tell where to start and how to continue. For example, the rule "Start at 2 and keep adding 2" leads to this pattern:
2, 4, 6, 8, 10, … .
To determine the 40th term in the pattern, you need to know the 39th term.

But some rules relate a term's value to its position. For example, the rule "A term's value is twice as great as its position in the pattern" tells you that the value of the 4th term is 2 × 4 = 8, and the value of the 10th term is 2 × 10 = 20.

In fact, both of these rules describe the same pattern:
2, 4, 6, 8, 10, … .
It turns out, though, that the second kind of rule makes it easier to find the value of terms late in the pattern.

Why Do We Need Pattern Rules?

Pattern rules are necessary. Without a rule, you don't know how to continue a pattern.

Why Do We Need Pattern Rules? (continued)

For example, a pattern that starts 5, 10, 15, … could continue
5, 10, 15, 20, 25, 30, … (adding 5 each time),
5, 10, 15, 105, 110, 115, 205, 210, 215, … (adding 5 twice and then 90),
or
5, 10, 15, 25, 30, 35, 45, … (adding 5 twice and then 10).

Figuring Out a Pattern Rule

Sometimes you don't know a rule, and you have to figure out what it could be. You can never be sure, but you can use the relationships between the values you do know to predict what the rule might be.

For example, for the pattern that begins 3, 7, 11, 15, 19, …, you might predict that the rule is either "Start at 3 and keep adding 4" or "Multiply the position by 4 and subtract 1."

You might not guess the second rule unless you notice that the numbers 3, 7, 11, 15, 19, … are each one less than the numbers 4, 8, 12, 16, 20, … .

Notes

In later grades, pattern rules will often be written using algebra, but not in Grade 6.

You can often assume a rule, but you can't be completely sure unless you're told, since other rules are always possible.

Definitions

pattern rule: a description that tells how a pattern starts and how it continues; for example, a pattern rule for 2, 4, 8, 16, … is "Start at 2 and multiply by 2 each time"

term: each element in a pattern