



Reteaching

1.5 Representing Linear Patterns

◆ Skill A Finding the first differences and writing an equation to represent data patterns

Recall If the top row of a data table starts at 0 and increases by 1 in each column, you can find the first difference by subtracting the numbers in the second row.

◆ Example

Find the first differences, and write the equation that represents the pattern.

0	1	2	3	4	5	6
15	17	19	21	23	25	27

◆ Solution

First differences: $\begin{array}{ccccccc} 15 & 17 & 19 & 21 & 23 & 25 & 27 \\ & \swarrow & \swarrow & \swarrow & \swarrow & \swarrow & \swarrow \\ & 2 & 2 & 2 & 2 & 2 & 2 \end{array}$

To write the equation, use the numbers in the top row for the independent variable and the numbers in the bottom row for the dependent variable. Notice that when $x = 0$, $y = 15$.

Write $y = 15 + (\text{first difference}) \times x$.

The first difference is 2.

The equation is $y = 15 + 2x$.

Check another point, such as $x = 4$, in the table:

$$y = 15 + 2 \cdot 4 = 15 + 8 = 23$$

This y -value, 23, matches the one in the table.

Find the first differences for each data set, and write an equation to represent the data pattern.

1.

0	1	2	3	4	5	6
0	2	4	6	8	10	12

2.

0	1	2	3	4	5	6
25	21	17	13	9	5	1

3.

0	1	2	3	4	5	6
-1	-4	-7	-10	-13	-16	-19

4.

0	1	2	3	4	5	6
-25	-20	-15	-10	-5	0	5