

Chapter Review



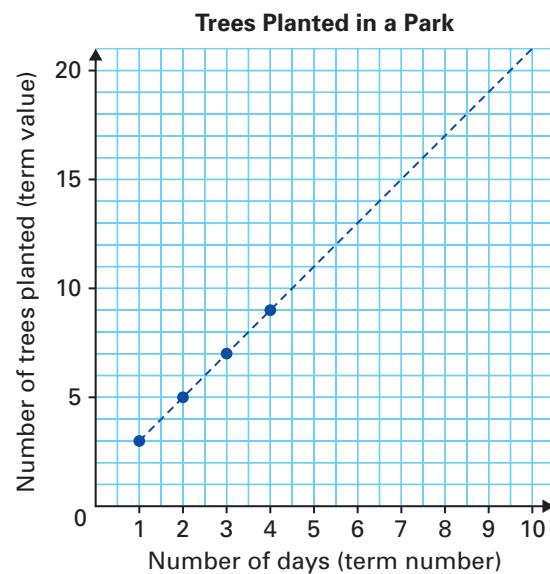
Frequently Asked Questions

Q: How can you use a scatter plot to represent a pattern?

A: A scatter plot shows the relationship between two quantities in a table of values. Use the x -axis to show the term number and the y -axis to show the term value.

For example, the table and graph show the number of trees planted in a park over several days. Each row of the table is represented as a point on the scatter plot. The points form a line, which can be extended to show other values in the pattern. The algebraic expression for this relationship is $2n + 1$.

Number of days	Number of trees planted
1	3
2	5
3	7
4	9
:	:
n	$2n + 1$



Q: What are the advantages and disadvantages of using a scatter plot to represent a pattern?

A: Advantages

A scatter plot is a visual representation of a pattern. You can use a scatter plot to predict trends without doing the calculations. You can also use a scatter plot to determine an unknown value when solving a problem.

For example, you can use the scatter plot on this page to determine the term value when the term number is 7, or the term number when the term value is 19. From the graph, you can tell that the coordinates of those points are (7, 15) and (9, 19).

Disadvantages

Sometimes the scale on an axis is too large or too small. Then a scatter plot may not be as accurate as a pattern rule for predicting term values.

For example, the scatter plot on this page is not very helpful for determining the term value when the term number is 195. Instead, you need to use the pattern rule:

$$\begin{aligned}2n + 1 &= 2 \times 195 + 1 \\&= 390 + 1 \\&= 391\end{aligned}$$

The 195th term is 391.

Practice Questions

- (4.2) 1. A student council is planning a penny drive for charity. To promote interest in the event, the students have designed a series of posters. Each poster uses pennies to form a figure in the following pattern:



Figure 1



Figure 2

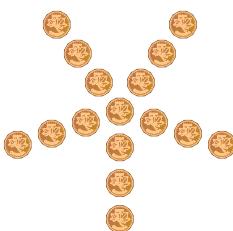


Figure 3

- a) Which part of the pattern changes and which part stays the same in each figure?
 b) Describe the relationship between the term number and the term value in the pattern.
 c) Determine an algebraic pattern rule.
 d) How many pennies are needed for the 12th poster in the pattern?
- (4.3) 2. a) Use a table of values to determine a pattern rule for the sequence 5, 7, 9, 11,
 b) Write an algebraic expression for the n th term of the sequence.
 c) Calculate the 70th term in the sequence.
- (4.3) 3. How many counters would you need to make the 50th term in this sequence?

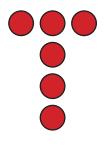


Figure 1

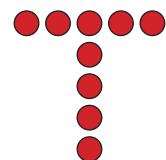


Figure 2

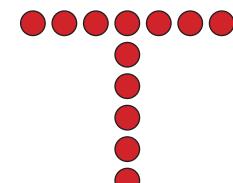
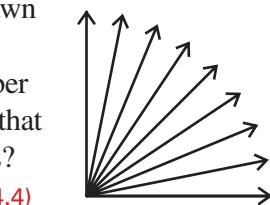


Figure 3

4. A right angle is formed by two rays extending from a common point. Seven more rays are then drawn inside the right angle.

What is the total number of angles, of all sizes, that are formed by the rays?



(4.4)

5. a) Use the data in the three tables of values to draw three scatter plots on the same pair of axes. Use a different colour for each scatter plot.

(4.5)

i)

Term number	Term value
4	3
6	4
10	6
12	
1	

ii)

Term number	Term value
3	5
4	7
5	9
10	
11	

iii)

Term number	Term value
2	7
5	13
6	15
8	
9	

- b) Determine the missing values in each table of values.
 c) Write an algebraic expression for each pattern rule.