

Chapter 1: Patterns in Mathematics

Describe and extend patterns.

Pattern rules describe how a pattern begins and how it continues. Pattern rules can be represented using words and operations. For example, a pattern rule for 3, 5, 7, 9, . . . is “start at 3 and add 2 each time.”

1. Daniel is on a bike trip. The table shows the distance Daniel travels each hour.

Distance Travelled Each Hour

Time (h)	Distance (km)
1	6
2	12
3	18
4	12

a) Describe a pattern for the second column of the table.

b) If the pattern continues, how many kilometres will Daniel travel in 7 hours?

2. Write a pattern rule for each pattern. Is it an increasing pattern or a decreasing pattern?

a) 4, 8, 12, 16, . . . _____

b) 50, 41, 32, 23, . . . _____

c) 3, 12, 48, 192, . . . _____

3. Extend each pattern for four more terms.

a) 21, 18, 28, 24, 35, 30, . . . _____

b) 35, 31, 27, 23, 19, . . . _____

c) 16, 19, 22, 25, 28, . . . _____

Use patterns to solve a problem.

4. Nikesh and Hannah are travelling east to visit their relatives. Nikesh travels by train 105 km each hour. Hannah travels by car 90 km each hour. Hannah starts 1 h before Nikesh. How many hours will it take Nikesh to catch up to Hannah?

Hannah's Trip

Time (h)	Distance (km)
1	
2	

Nikesh's Trip

Time (h)	Distance (km)
1	
2	

Solve equations.

5. Solve each equation.

a) $x + 2 = 5$ $x =$ _____

e) $4 + n = 7$ $n =$ _____

b) $6 = s - 2$ $s =$ _____

f) $12 = 3 \times d$ $d =$ _____

c) $3 + z = 7$ $z =$ _____

g) $y - 5 = 13$ $y =$ _____

d) $6 \times c = 24$ $c =$ _____

h) $12 = t - 5$ $t =$ _____