MATHEMATICS · GRADES 4-6

Number patterns and rules

Difficulty level: Intermediate

Mathematics: Grades 4-6

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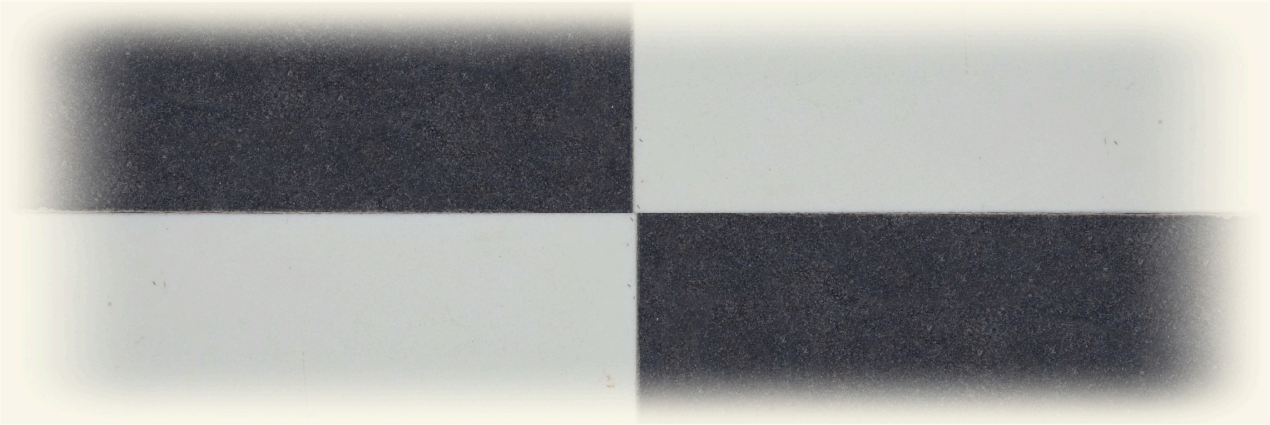
Overview of the concept

This is how you work out what comes next in a pattern, like how many tiles you need for the tenth row of a floor or how your savings grow each month. A tiler works out the next row without laying it first, and a saver works out next month's balance without waiting for the statement. The same skill tells a gardener how many plants fit in each new row, or a runner how far the next week of training goes. Once you can name the rule, you can predict any step in the pattern, not just the next one.



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Worked examples

EXAMPLE 1

Q Pattern: 2, 4, 6, 8. What is the rule?

SOLUTION

2, 4, 6, 8

Each term: add 2

Rule: start at 2, add 2 each time

Find the gap between terms: 4 - 2 = 2, 6 - 4 = 2

The gap never changes, so the rule is add 2 each time.

Next terms: 10, 12

EXAMPLE 2

Q Pattern: 1, 3, 5, 7. What is the rule?

SOLUTION

1, 3, 5, 7

Each term: add 2

Rule: start at 1, add 2 each time

Find the gap: 3 - 1 = 2, 5 - 3 = 2

The gap never changes, so the rule is add 2 each time.

Next terms: 9, 11

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Practice questions

1 The numbers go 9, 18, 27, 36. How does each number change?

- **A** Add 9 each time
- **B** Add 3 each time
- **C** Multiply by 9 each time
- **D** Add 18 each time

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2 The numbers go 5, 10, 15, 20. What number comes just before 5 in the pattern?

- **A** 0
- **B** -5
- **C** 5
- **D** 10

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3 The numbers go 3, 6, 12, 24. How does each number change?

- A Add 3 each time
- B Add 2 each time
- C Multiply by 2 each time
- D Multiply by 3 each time

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4 The numbers go 50, 45, 40, 35. What is the rule?

- A Subtract 5 each time
- B Add 5 each time
- C Subtract 10 each time
- D Subtract 15 each time

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5 The numbers go 1, 4, 7, 10. What is the 10th number in the pattern?

- A 28
- B 31
- C 25
- D 30

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6 The numbers go 2, 6, 18, 54. Is the pattern made by adding the same number or multiplying by the same number each time?

- A Multiplying by the same number
- B Adding the same number
- C Adding a bigger number each time
- D Subtracting the same number

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7 The numbers go 100, 90, 80, 70. Count on in the pattern. How many numbers are there from 100 down to 0, including 0?

- A 11
- B 10
- C 9
- D 12

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8 The numbers go 4, 8, 12, 16. Which number does NOT belong in the pattern?

- A 20
- B 24
- C 22
- D 28

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9 A pattern starts at 3 and multiplies by 2 each time. What are the first four numbers?

- **A** 3, 6, 12, 24
- **B** 3, 5, 7, 9
- **C** 3, 6, 9, 12
- **D** 6, 12, 24, 48

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10 Which of these patterns follows the rule 'add 7 each time'?

- **A** 7, 14, 21, 28
- **B** 7, 14, 28, 56
- **C** 7, 9, 11, 13
- **D** 7, 10, 13, 16

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ANSWER KEY

1. Add 9 each time

2. 0

3. Multiply by 2 each time

4. Subtract 5 each time

5. 28

6. Multiplying by the same number

7. 11

8. 22

9. 3, 6, 12, 24

10. 7, 14, 21, 28

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