Unit 4 · Numerical Expressions and Patterns Cheat Sheet

Unit 4 focus: grouping symbols and writing and interpreting expressions

1 Big Idea

Grouping symbols tell you what to do first. Work from the inside out: ( ), then [ ], then { }. Then × and ÷, then + and −.

2 Important Vocabulary

numerical expression	Numbers and operation signs with no equals sign.	4 × (3 + 5)
evaluate	Find the value of an expression.	4 × (3 + 5) = 32
parentheses ( )	Grouping symbols that show what to do first.	(2 + 3) × 4 = 20
order of operations	The rules for which step to do first: grouping, then × and ÷, then + and −.	3 + 4 × 2 = 11

3 How It Works

Evaluate 2 × [12 − (3 + 5)].

Example: 2 × [12 − (3 + 5)]
Parentheses: 3 + 5 = 8
Brackets: 12 − 8 = 4
Multiply: 2 × 4

Answer: 8

4 Visual Model

"Multiply 6 by 4, then add 3" → (6 × 4) + 3

"Add 6 and 4, then multiply by 3" → 3 × (6 + 4)

4 × (93 + 18) is 4 times as large as 93 + 18

5 ★ Remember This · Watch Out!

★ Remember this

- You can compare expressions without calculating.
- Words like "sum," "difference," "product," and "quotient" name operations.

⚠ Watch out!

- **Working left to right:** 3 + 4 × 2 = 11, not 14
- **Forgetting parentheses:** "add, then multiply" needs ( )

6 Try It!

1. (15 − 3) ÷ 4 + 2 = ?
   Answer: 5
2. Write "subtract 2 from 9, then multiply by 5."
   Answer: (9 − 2) × 5

Answers are printed upside down. Turn the page to check!

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More practice: number patterns and relationships between two patterns

1 Big Idea

A pattern follows a rule. Two patterns can be compared term by term and graphed as ordered pairs.

2 Important Vocabulary

pattern	Numbers that follow a rule.	3, 6, 9, 12, …
rule	Tells how to get the next term.	Add 3
term	One number in a pattern.	In 2, 4, 6, the 3rd term is 6
ordered pair	Two numbers (x, y) that name a point on a graph.	(2, 6)

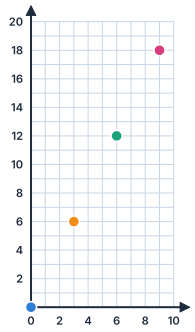
3 How It Works

Pattern A: start 0, add 3. Pattern B: start 0, add 6.

Example: Compare the terms.
A: 0, 3, 6, 9
B: 0, 6, 12, 18

Answer: Each B term is 2 times the A term

4 Visual Model



Graphing (A, B): (0, 0), (3, 6), (6, 12), (9, 18) — the points line up.

5 ★ Remember This · Watch Out!

★ Remember this

- The first number of the pair comes from Pattern A, the second from Pattern B.
- Check the rule on more than one term.

⚠ Watch out!

- **Mixing up the order:** (3, 6) is not (6, 3)
- **"More" vs "times":** 6 is 3 more than 3, but 2 times 3

6 Try It!

1. Start at 1, multiply by 3. What is the 5th term?
   Answer: 81
2. A: add 5, B: add 15 (start 0). Pair for term 3?
   Answer: (30, 10)

Answers are printed upside down. Turn the page to check!