Name & Surname: _____ Class: _____ Date: _____

Grouping Symbols First

Parentheses, brackets, and braces in expressions

About 45 minutes Level ★★★☆☆

Groups First, Then Calculate

An **expression** shows numbers and operations without an equals sign. Do grouped parts **first** before other operations.

- Do the **innermost** group first: ( ) , then [ ] , then { }.
- Next do **multiplication** and **division** from left to right, then + and − from left to right.
- Example: {2 × [3 + (4 − 1)]} = {2 × [3 + 3]} = {2 × 6} = 12. The **brackets** tell you what to group.

Task A

/3

Write each digit in its column. Read the value to check the number.

Number	Th	H	T	O	t	h
364						
2507						
68.35						

Th = thousands · H = hundreds · T = tens · O = ones · t = tenths · h = hundredths

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Practice With Parentheses

Evaluate expressions by starting with the innermost group.

Key words

parentheses: ( ) that group numbers to do first

braces: { } that group the largest part

evaluate: find the value of an expression

brackets: [ ] that group a larger part

expression: numbers and operations without an equals sign

Task B

/10

Evaluate each expression. Always start with the innermost group.

WARM UP

1 Work out 3 × (4 + 2). Start with the **group**.

Answer: _____

2 Work out (15 − 7) ÷ 2. Start with the **parentheses**.

Answer: _____

3 Work out 20 − [6 + 2]. Start with the **brackets**.

Answer: _____

4 Work out {5 + 3} × 2. Start with the **braces**.

Answer: _____

PRACTICE

5 Work out 2 × [4 + (6 ÷ 2)]. Do the **innermost** group first.

Answer: _____

6 Work out {30 − [10 − (2 + 3)]}. Work from the **inside** out.

Answer: _____

7 Work out (6 + 4) × (9 − 5). Evaluate both **groups** first.

Answer: _____

PROBLEM SOLVING

8 A student packs 2 bags with (3 pencils + 4 erasers) in each bag. How many **items** are packed in all?

Answer: _____

9 A club has $24. It spends (10 − 4) dollars on posters and 6 dollars on tape. How many **dollars** are left?

Answer: _____

10 Student A says 12 − (4 + 2) equals 12 − 4 + 2. Do you **agree**? Explain how you **know**.

Answer: _____

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Bigger Grouping Challenge

Use brackets and braces to solve harder expressions.

Task C

/10

Use brackets and braces to group larger parts. Evaluate the innermost part first.

WARM UP

1 Work out {4 × (2 + 3)} − 6. Start with the **parentheses**.

Answer: _____

2 Work out 50 − [(3 × 4) + 5]. Start with the **innermost** group.

Answer: _____

3 Work out [(8 − 3) × 2] + 9. Evaluate the **brackets** first.

Answer: _____

4 Work out 100 ÷ {5 × (6 − 4)}. Work from the **inside** out.

Answer: _____

PRACTICE

5 Work out 3 × [2 + (12 ÷ 4)] + 5. Do **division** inside the **group** first.

Answer: _____

6 Work out {(7 − 2) × [9 − 4]} ÷ 5. Evaluate both **groups** first.

Answer: _____

7 Work out [(15 + 5) ÷ 4] + {2 × 3}. Evaluate the **expression** in steps.

Answer: _____

PROBLEM SOLVING

8 A class needs $60 for supplies. They collect $5 from each of (6 + 4) students. How many more **dollars** do they still need?

Answer: _____

9 A baker packs 3 boxes. Each box holds [(2 + 6) ÷ 2] muffins. How many **muffins** are packed in all?

Answer: _____

10 Student B says [10 − (2 + 3)] gives the same answer as 10 − 2 + 3. Is Student B **correct**? Explain how you **know**.

Answer: _____

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Solve Real Problems

Use grouping to solve money, chairs, and cooking problems.

Task D

/6

Show your working for each expression. Do grouped parts first.

1. A student has $20. She buys 2 packs that cost ($3 + $4) each. How much **money** is left?

Working

Answer

_____ **$**

2. A team sets up 3 rows with (5 + 2) chairs in each row. How many **chairs** are set up in all?

Working

Answer

_____ **chairs**

3. A cook makes [(10 + 6) ÷ 2] cups of mix and shares it equally into 2 bowls. How much mix goes in each **bowl**?

Working

Answer

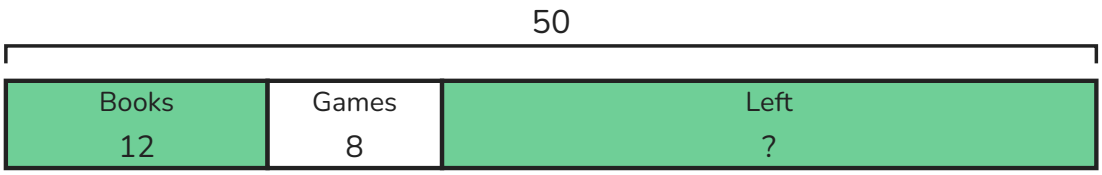
_____ **cups**

Task E

/4

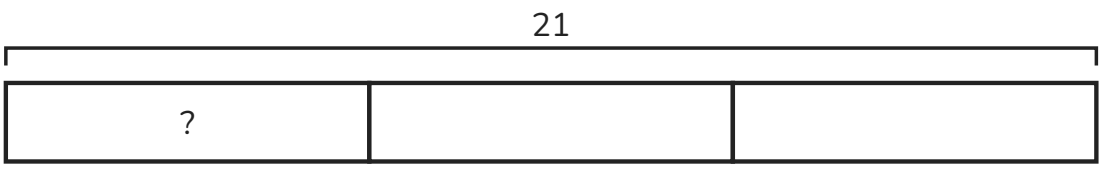
Use the bar to show the groups. Write the missing value.

1 A club has $50. It spends $12 on books and $8 on games. How much **money** is left?



Answer: _____ **dollars**

2 There are 21 marbles packed equally into 3 bags. Each bag holds 4 red marbles and 3 blue marbles. How many **marbles** are in each bag?



Answer: _____ **marbles**

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Show What You Know

Place answers on a line and follow worked steps.

↑↓ Task F

/3

Evaluate A = 2 × (4 + 3) and B = 4 × (5 + 2). Find A and B, then **place** 12 on the **line.**



A = ☐ B = ☐ Draw an arrow to show: 12

Task G

/2

Follow the steps to evaluate groups from the inside out.

WORKED EXAMPLE

Work out 5 × (6 − 2) + 3. Start with the group.

1. Do the **innermost** group first: 6 − 2 = 4
2. **Multiply** next: 5 × 4 = 20
3. **Add** last: 20 + 3 = 23

Answer: 23

YOUR TURN

Work out 4 × (7 − 3) + 5. Start with the group.

Answer: _____

WORKED EXAMPLE

Work out {3 × [2 + (9 − 5)]}. Work from the inside out.

1. Do the **innermost** group: 9 − 5 = 4
2. Next do the **brackets**: 2 + 4 = 6
3. Last do the **braces**: 3 × 6 = 18

Answer: 18

YOUR TURN

Work out {4 × [1 + (6 − 2)]}. Work from the inside out.

Answer: _____

How did I do?

Circle a face for each line.

I can evaluate expressions with parentheses, brackets, and braces. ☹ 😐 ☺

I can start with the innermost group first. ☹ 😐 ☺

I can write and solve real-life problems using grouping symbols. ☹ 😐 ☺

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Answer sheet: Grouping Symbols First

Task A

1. 364: – | 3 | 6 | 4 | – | –
2. 2507: 2 | 5 | 0 | 7 | – | –
3. 68.35: – | – | 6 | 8 | 3 | 5

Task B

1. 18
2. 4
3. 12
4. 16
5. 14
6. 25
7. 40
8. 14
9. 12
10. No. The parentheses group 4 + 2, so 12 – 6 = 6, not 10.

Task C

1. 14
2. 33
3. 19
4. 10
5. 20
6. 5
7. 11
8. 10
9. 12
10. No. [10 – (2 + 3)] = 5, but 10 – 2 + 3 = 11. The brackets change the order.

Task D

1. $6 (20 – 2 × (3 + 4) = 20 – 14 = 6)
2. 21 chairs (3 × (5 + 2) = 3 × 7 = 21)
3. 4 cups ([(10 + 6) ÷ 2] ÷ 2 = 8 ÷ 2 = 4)

Task E

1. 30 dollars
2. 7 marbles

Task F

A = 14; B = 28; arrows at 12

Task G

1. 21
2. 20

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