Parentheses, Brackets, and Braces

Grade 5 Math • Section 3.2

Name: _____	Date: _____	Score: _____ / 14

Quick Review and Helpful Hints

- **Grouping symbols:** Parentheses ( ), brackets [ ], braces { }.
- **Rule:** Work from the **innermost** grouping outward. Evaluate parentheses first, then brackets, then braces.
- All three types of grouping symbols mean "do this first." They are used together to make nested expressions easier to read.

Example: Evaluate $\{[3 + (5 \times 2)] - 4\} \times 3$.

Innermost first: $(5 \times 2) = 10$. Brackets next: $[3 + 10] = 13$. Braces: $\{13 - 4\} = 9$. Finally: $9 \times 3 = 27$.

Answer: 27

Practice Problems

Evaluate each expression by working from the innermost grouping outward.

1. $(6 + 2) \times [3 + 1] =$ _____
2. $[(8 - 3) \times 4] + 2 =$ _____
3. $\{[2 \times (4 + 1)] + 3\} =$ _____
4. $5 \times [(9 - 5) + 2] =$ _____
5. $\{[(12 - 4) \div 2] + 6\} \times 2 =$ _____
6. $[(15 \div 3) + (4 \times 2)] =$ _____
7. $3 \times \{[8 + (6 \div 2)] - 5\} =$ _____
8. $\{[5 + 3] \times [7 - 4]\} - 10 =$ _____
9. $[(20 - 6) \div (3 + 4)] \times 5 =$ _____
10. $\{[2^3 + (3 \times 2)] - 4\} =$ _____
11. $4 + \{[6 \times (1 + 2)] \div 9\} =$ _____
12. $\{[(18 - 6) \div 3] + 1\} \times 7 =$ _____

Word Problems

13. Write a numerical expression using parentheses and brackets that equals 40: "Add 3 and 5, then multiply by the difference of 9 and 4." Evaluate to check.

_____

14. Alex evaluates $\{[4 + (2 \times 3)] \times 5\}$ and gets 70. Check his work and explain whether he is correct.

_____

Answer Keys

1. $\boxed{32}$
2. $\boxed{22}$
3. $\boxed{13}$
4. $\boxed{30}$
5. $\boxed{20}$
6. $\boxed{13}$
7. $\boxed{18}$
8. $\boxed{14}$
9. $\boxed{10}$
10. $\boxed{10}$
11. $\boxed{6}$
12. $\boxed{35}$
13. $\boxed{(3+5)\times(9-4)=40}$
14. $\boxed{\text{No; } 50}$

Step-by-Step Explanations

1. Start with the main idea. For parentheses, brackets, and braces, follow the order of operations in $(6+2)\times[3+1]$. The value is 32. Grouped expressions come first, then exponents, then multiplication or division before addition or subtraction.

2. Keep the work tidy. For parentheses, brackets, and braces, follow the order of operations in $[(8-3)\times 4]+2$. The value is 22. Work from the inside out when you see parentheses, brackets, or braces.

3. Look at what the numbers mean. For parentheses, brackets, and braces, follow the order of operations in $\{[2\times(4+1)]+3\}$. The value is 13. One careful line at a time is better than trying to do the whole expression mentally.

4. Use the setup first. For parentheses, brackets, and braces, follow the order of operations in $5\times[(9-5)+2]$. The value is 30. Grouped expressions come first, then exponents, then multiplication or division before addition or subtraction.

5. Check the size of the answer. For parentheses, brackets, and braces, follow the order of operations in $\{[(12-4)\div 2]+6\}\times 2$. The value is 20. Work from the inside out when you see parentheses, brackets, or braces.

6. Match the operation to the words. For parentheses, brackets, and braces, follow the order of operations in $[(15\div 3)+(4\times 2)]$. The value is 13. One careful line at a time is better than trying to do the whole expression mentally.

7. Write the important values first. For parentheses, brackets, and braces, follow the order of operations in $3\times\{[8+(6\div 2)]-5\}$. The value is 18. Grouped expressions come first, then exponents, then multiplication or division before addition or subtraction.

8. Follow the pattern carefully. For parentheses, brackets, and braces, follow the order of operations in $\{[5+3]\times[7-4]\}-10$. The value is 14. Work from the inside out when you see parentheses, brackets, or braces.

9. Start with the main idea. For parentheses, brackets, and braces, follow the order of operations in $[(20-6)\div(3+4)]\times 5$. The value is 10. One careful line at a time is better than trying to do the whole expression mentally.

10. Keep the work tidy. For parentheses, brackets, and braces, follow the order of operations in $\{[2^3+(3\times 2)]-4\}$. The value is 10. Grouped expressions come first, then exponents, then multiplication or division before addition or subtraction.

11. Look at what the numbers mean. For parentheses, brackets, and braces, follow the order of operations in $4+\{[6\times(1+2)]\div 9\}$. The value is 6. Work from the inside out when you see parentheses, brackets, or braces.

12. Use the setup first. For parentheses, brackets, and braces, follow the order of operations in $\{[(18-6)\div 3]+1\}\times 7$. The value is 35. One careful line at a time is better than trying to do the whole expression mentally.

13. Check the size of the answer. For parentheses, brackets, and braces, add $3+5=8$ and subtract $9-4=5$; $8\times 5=40$. Grouped expressions come first, then exponents, then multiplication or division before addition or subtraction.

14. Match the operation to the words. For parentheses, brackets, and braces, inside the braces, $4+(2\times 3)=10$, and $10\times 5=50$, not 70. Work from the inside out when you see parentheses, brackets, or braces.

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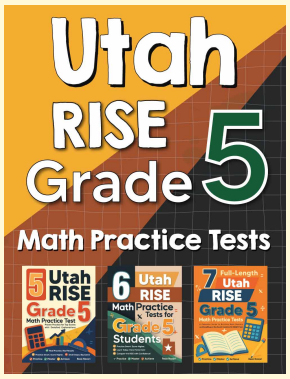

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