# 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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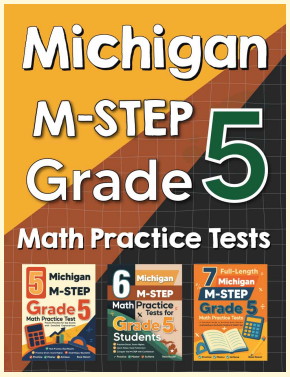


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