

- ❑ We will evaluate¹ numerical expressions involving rational numbers.
- ❑ Students will be able to group symbols dictating the order of applying calculations and how the absence or different placement of these symbols can lead to different results given the same numbers and operations.
- ❑ Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

**Common Core Standard 6.NS.1 &
6.NS.2 Prerequisite Skills**

Apply and extend previous understandings of addition, subtraction, multiplication, and division of integers (AND other rational numbers).

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What are we going to learn?

What does *evaluate* mean?

Evaluate means _____.

Make Connection

Students, you already know how to evaluate simple expressions. Now, we will evaluate numerical expressions that include grouping symbols.

Activate Prior Knowledge

Evaluate from left to right.

1. $4 \times 12 + 38$

2. $10 \times 6 + 8$

Vocabulary

¹ find the value



A **numerical expression** is made up of **numbers** connected by **operations** (+, −, ×, ÷).

- *The operation in the **grouping symbols** is calculated first.*

Evaluating Numerical Expressions

Without Grouping Symbols

$$10 \times 6 + 8$$

$$60 + 8$$

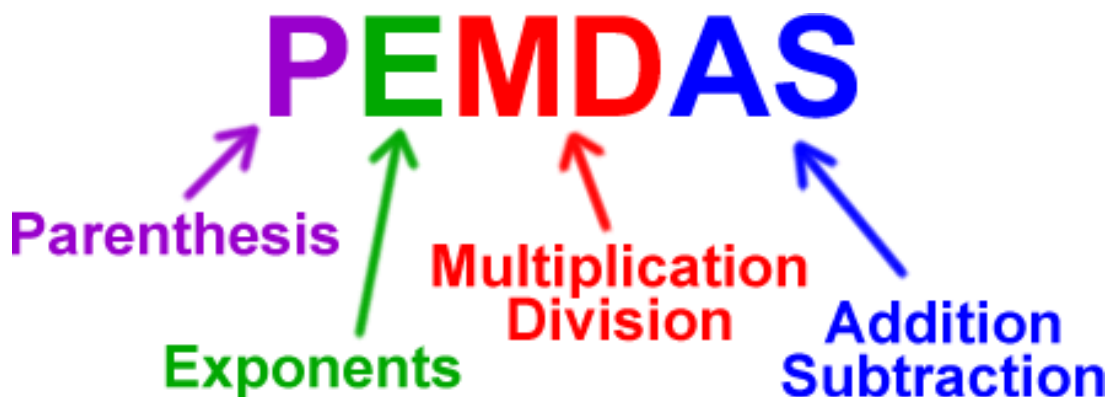
$$68$$

With Grouping Symbols

$$10 \times (6 + 8)$$

$$10 \times 14$$

$$140$$



What is the correct order of operations?

1. _____ 2. _____ 3. _____ 4. _____

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$$3 + (42 - 16)$$

To evaluate the numerical expression above, which operation would be calculated first? How do you know?

- A $3 + 42$
- B $42 - 16$

In your own words, what do grouping symbols mean in a numerical expression?

"Grouping symbols mean _____."

A **numerical expression** is made up of **numbers** connected by **operations** (+, −, ×, ÷).

- The operation in the **grouping symbols** is calculated first.

Grouping Symbols

()
parentheses

Evaluate numerical expressions.

- 1 Calculate the operation in the grouping symbols. (Evaluate)
- 2 Continue to evaluate to get a final value.

1. $(28 + 36) \div 4$

2. $28 + (36 \div 4)$

When there are two separate grouping symbols, either one can be evaluated first.

3. $(28 + 32) \times (48 - 18)$

4. $(72 \div 9) \times (63 - 13)$

5. Sunny got \$40 from her parents and \$60 from her grandparents for her birthday.

Sunny saved half of the money.

The following are expressions that represents the amount of money that Sunny saved in her piggy bank.

$$\frac{1}{2} \times (40 + 60) \quad \text{and} \quad \left(\frac{1}{2} \times 40\right) + \left(\frac{1}{2} \times 60\right)$$

How much money did Sunny save in her piggy bank? Evaluate both expressions.

6. Christian bought 3 bags of marbles and Eric bought 5 bags.

Each bag has 10 marbles.

The following are expressions that represents the number of marbles Christian and Eric bought altogether.

$$10 \times (3 + 5) \quad \text{and} \quad (10 \times 3) + (10 \times 5)$$

How many marbles did Christian and Eric buy altogether? Evaluate both expressions.

A **numerical expression** is made up of **numbers** connected by **operations** (+, −, ×, ÷).

- The operation in the **grouping symbols** is calculated first.

1 Evaluating numerical expressions will help you when purchasing items.



Blaze player
\$50

Limited Time
Buy **3**
Save **\$20**

Sam's Electronics is having a special on their Blaze music players. What is the total price for 3 music players?

$$(50 \times 3) - 20$$

$$150 - 20$$

$$130$$

The total price is \$130.

2 Evaluating numerical expressions will help you do well on tests.

Sample Test Question:

Select the numerical expressions that have a value of 52 when evaluated. Choose Yes or No for A and B.

A $(10 + 3) \times 4$

Yes No

B $10 + (3 \times 4)$

Yes No

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Does anyone else have another reason why it is relevant to evaluate numerical expressions? (Pair-Share) Why is it relevant to evaluate numerical expressions? You may give one of my reasons or one of your own. Which reason is more relevant to you? Why?

A **numerical expression** is made up of **numbers** connected by **operations** (+, −, ×, ÷).

- *The operation in the **grouping symbols** is calculated first.*

Grouping Symbols

()
parentheses

Evaluate numerical expressions.

- 1 Calculate the operation in the grouping symbols. (Evaluate)
- 2 Continue to evaluate to get a final value.

1. $(27 - 13) \times 5$

2. $(34 + 15) \div (62 - 55)$

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Place grouping symbols in the numerical expression so that $10 + 25$ is calculated first. Then evaluate. How would the value of the expression change if grouping symbols were placed around $25 \div 5$ instead?

$$10 + 25 \div 5$$

Word Bank

evaluate

perform

first

parentheses

Summary Closure

What did you learn today about evaluating numerical expressions? (Pair-Share)
Use words from the word bank.

A **numerical expression** is made up of **numbers** connected by **operations** (+, −, ×, ÷).

- The operation in the **grouping symbols** is calculated first.

Evaluate numerical expressions.

- 1 Calculate the operation in the grouping symbols. (Evaluate)
- 2 Continue to evaluate to get a final value.

Grouping Symbols

()
parentheses

1. $(56 + 28) \div 7$ 2. $(56 \div 7) + (28 \div 7)$ 3. $9 \times (50 + 7)$ 4. $(9 \times 60) - (9 \times 3)$

5. Each bottle of water has about 17 fluid ounces (fl oz).

Mrs. Garcia brought 12 bottles and Mr. Robison brought 10 bottles for the 5th grade students volunteering to clean up the local park.

The following is an expression to represent the number of fluid ounces of water.

$$17 \times (12 + 10)$$

What is the total amount of water in fluid ounces?

6. Half of the bottles were given to young kids playing in the park.

The following is an expression to represent the number of bottles given to the young kids.

$$\frac{1}{2} \times (12 + 10)$$

How many bottles were given to the young kids?

- 1. $(13 + 20) \times 4$
- 2. $(30 \times 7) - (54 \div 6)$
- 3. $(14 \times \frac{1}{2}) + (24 \times \frac{1}{2})$

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1. Decide if the value of the expression is less than, equal to, or greater than 52. Write a check mark in the correct column.

	Less than 52	Equal to 52	Greater than 52
A $(10 + 3) \times 4$			
B $10 + (3 \times 4)$			
C $(40 + 12) \div 4$			
D $39 + 6 + 7$			

2. Decide if the value of the expression is less than, equal to, or greater than 27. Write a check mark in the correct column.

	Less than 27	Equal to 27	Greater than 27
A $54 \div (6 \times 3)$			
B $(12 \times 7) - (34 + 23)$			
C $(54 \div 6) \times 3$			
D $(9 \times 3) + 15$			

1. $(14 + 36) \times (77 - 17)$

2. $40 \times (58 - 23)$

3. $(32 \times \frac{1}{4}) + (40 \times \frac{1}{4})$

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Place () in the numerical expression to get the value.

1. $32 + 15 \times 4 = 188$

2. $56 \div 8 - 4 = 14$

3. $32 + 15 \times 4 = 92$

4. $20 - 10 \times 10 + 7 = 170$

5. $56 \div 8 - 4 = 3$

6. $5 \times 10 + 5 \times 7 = 85$

- 1. $(72 \div 6) + (86 - 59)$
- 2. $(200 \times \frac{1}{2}) + (50 \times \frac{1}{2})$
- 3. $250 \times \frac{1}{2}$

Access Common Core

1. Fill in the blanks to create numerical expressions that have a **value of 32** when evaluated.

$$\boxed{4} \times (\boxed{} + \boxed{}) = 32$$

$$\boxed{4} \times (\boxed{} - \boxed{}) = 32$$

$$(\boxed{4} \times \boxed{}) + (\boxed{4} \times \boxed{}) = 32$$

2. Fill in the blanks to create numerical expressions that have a **value of 42** when evaluated.

$$\boxed{7} \times (\boxed{} + \boxed{}) = 42$$

$$\boxed{7} \times (\boxed{} - \boxed{}) = 42$$

$$(\boxed{7} \times \boxed{}) + (\boxed{7} \times \boxed{}) = 42$$