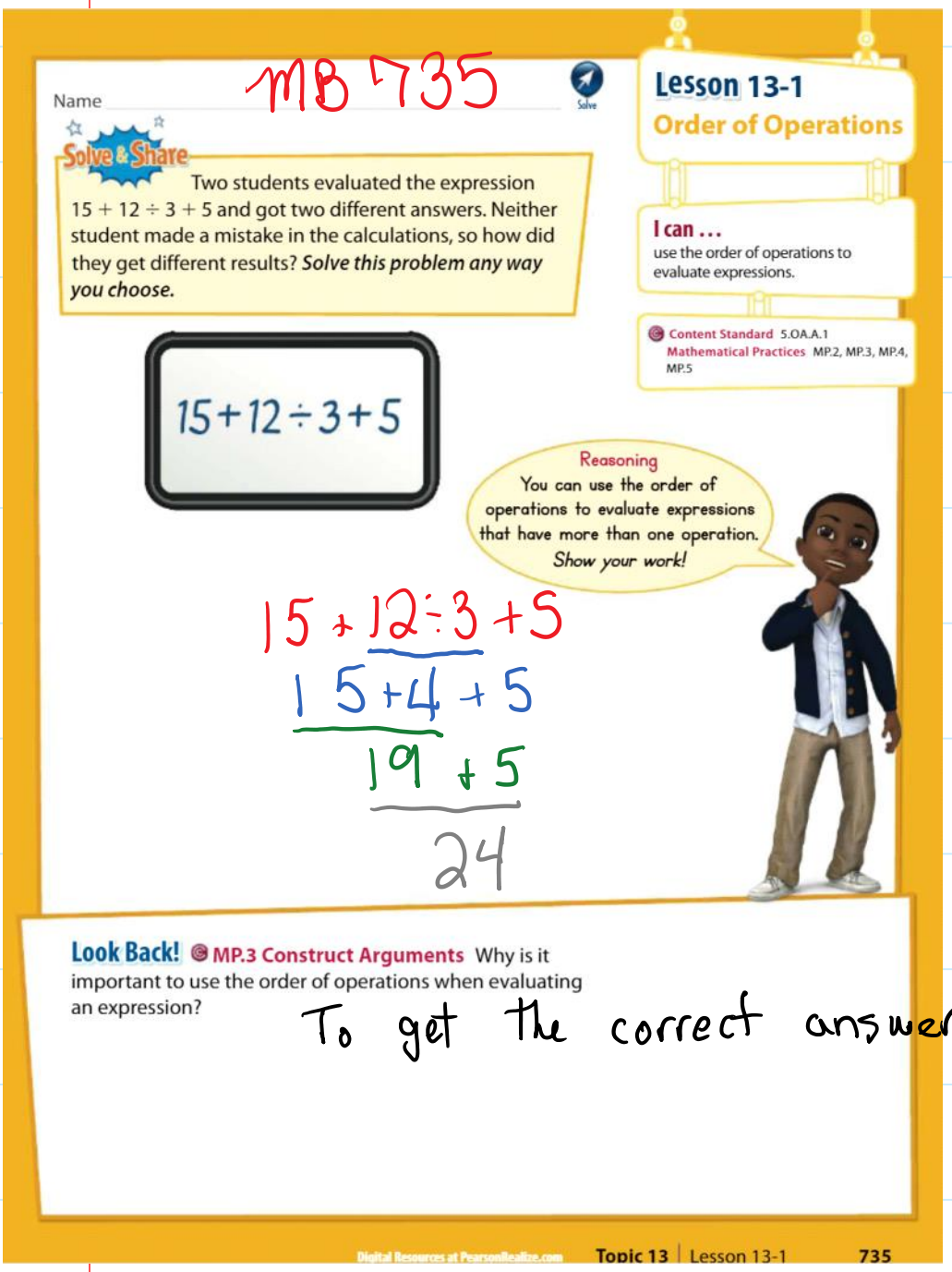
Lesson 13-1

Monday, April 13, 2020 10:54 AM



Name MB 735

Solve

Lesson 13-1
Order of Operations

Solve & Share

Two students evaluated the expression 15 + 12 ÷ 3 + 5 and got two different answers. Neither student made a mistake in the calculations, so how did they get different results? ***Solve this problem any way you choose.***

I can ...
use the order of operations to evaluate expressions.

Content Standard 5.OA.A.1
Mathematical Practices MP.2, MP.3, MP.4, MP.5

15+12÷3+5

Reasoning
You can use the order of operations to evaluate expressions that have more than one operation. *Show your work!*

15 + 12÷3 +5
15 +4 + 5
19 + 5
24

Look Back! MP.3 Construct Arguments Why is it important to use the order of operations when evaluating an expression?

To get the correct answer.

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How Can You Evaluate a Numerical Expression with More Than One Operation?

Two students evaluated the same numerical expression but got different answers. To avoid getting more than one answer, use the order of operations. Rebecca used the correct order.

Rebecca's Way

$36 + 9 \div 3 \times 5$
$36 + 3 \times 5$
$36 + 15$
51

Juan's Way

$36 + 9 \div 3 \times 5$
$45 \div 3 \times 5$
15×5
75

You can evaluate or find the value of $12 \div 4 + (9 - 2) \times (3 + 5)$ by using the order of operations.

Step 1

In using order of operations, do the operations inside parentheses first.

$12 \div 4 + (9 - 2) \times (3 + 5)$
$12 \div 4 + \quad 7 \quad \times \quad 8$

Step 2

Then, multiply and divide in order from left to right.

$12 \div 4 + 7 \times 8$
$3 \quad + \quad 56$

Step 3

Finally, add and subtract in order from left to right.

$3 + 56$
59

$12 \div 4 + (9 - 2) \times (3 + 5) = 59$

Remember to rewrite the calculations that still need to be done.

Convince Me! MP.3 Critique Reasoning In the first example, why was Juan's answer incorrect?

Juan added 36+9 instead of dividing 9÷3 first.

Name _____

Guided Practice*

Do You Understand?

1. Insert parentheses to make the following statement true.
$3 + 5 \times 2 - 10 = 6$

2. **Vocabulary** Write a numerical expression with **parentheses**. Then find the value of the expression.

Do You Know How?

In **3–7**, name the operation you should do first.

3. $6 + 27 \div 3$ Divide

4. $5 \times 2 + 12 \div 6$

5. $17.25 - (4.5 + 3.75)$

6. $(14 - 7) + (3 + 5)$

7. $4 \div 2 \times 8$

Complete 8, 25, 28, 32

Independent Practice

In **8–19**, use the order of operations to find the value of each expression.

8. $3 + 7 \times 6 \div 3$

9. $3 + 42 \div 3 \times 9 + (2 \times 14)$

10. $64 \div 8 \times \frac{1}{2}$

11. $(19 - 5) \times 3 + 4$

12. $15.3 - 12 + 2.5$

13. $36 - 5 + (16 - 11)$

14. $8 \times (3 + 2) - 6$

15. $3 \div (9 - 6) + 4 \times 2$

16. $(3 + 4) \times (3 + 5)$

17. $0.7 + 1.8 \div 6$

18. $4 \times (3 - 2) + 18$

19. $8 \times 6 - 4 \times 3$

In **20–25**, insert parentheses to make each statement true.

20. $30 - 4 \times 2 + 5 = 2$

21. $17 - 8 - 5 = 14$

22. $10 \div 2 - 3 + 1 = 3$

23. $30 - 4 \times 2 + 5 = 57$

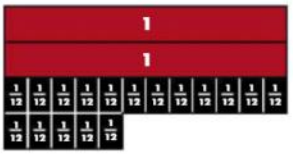
24. $17 - 8 - 5 = 4$

25. $10 \div 2 - 3 + 1 = 1$

*For another example, see Set A on page 767.

Math Practices and Problem Solving

26. **MP.4 Model with Math** Find the difference. Use the model.



$3\frac{5}{12} - 1\frac{7}{12}$

27. A small cruise ship has 220 passengers. At the Port of San Juan, 2 groups of 12 passengers go ashore to shop and 5 groups of 6 passengers go sightseeing. Evaluate $220 - (2 \times 12) - (5 \times 6)$ to find the number of passengers that are left on the ship.

28. **Higher Order Thinking** Joe says that the following statement is true. Do you agree? Explain.

$4 \times (3 + 5) - 10 = 4 \times 3 + 5 - 10$

$4 \times 8 - 10$ $\quad$ $12 + 5 - 10$

$32 - 10$ $\quad$ $17 - 10$

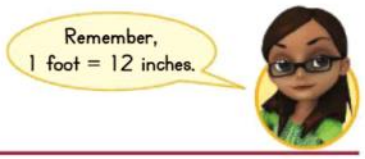
22 $\quad$ 7

No. The left side equals 22 and the right side equals 7.

29. **Number Sense** How many hundredths are in five tenths? How many thousandths are in five hundredths? Explain.

30. **MP.2 Reasoning** Ralph bought 3 boxes with 20 pencils each and 4 boxes with 10 pens each. To find the total number of pencils and pens, Ralph evaluated $3 \times 20 + 4 \times 10 = 100$. Is his answer reasonable? Explain.

31. **MP.5 Use Appropriate Tools** Tina wants to use rope to decorate a rectangular picture frame. The frame measures 18 inches wide and 12 inches tall. Tina has 4 feet of rope. Does she have enough rope to go around the perimeter of the frame? Explain.



Common Core Assessment

32. What is the value of the expression $3 \times 5 + (3 \times 9)$?

Ⓐ 35
Ⓑ 42
Ⓒ 96
Ⓓ 162

$3 \times 5 + (3 \times 9)$

$3 \times 5 + 27$

$15 + 27 = 42$

B

33. Which expression has a value of 8?

Ⓐ $11 - 6 - 3$
Ⓑ $12 + 30 \div 6$
Ⓒ $(9 + 7) \div 2$
Ⓓ $1 + 1 \times (2 + 2)$