

• Parentheses and the Associative Property

Power Up

facts

Power Up F

count aloud

Count up by 5s from 2 to 52. Count up and down by 3s between 0 and 36.

mental math

- Measurement:** Three feet equals 1 yard. How many feet is 12 yards?
- Number Sense:** 8×40 plus 8×2
- Number Sense:** 7×42
- Number Sense:** 6×42
- Fractional Parts:** $\frac{1}{2}$ of 40
- Fractional Parts:** $\frac{1}{4}$ of 40
- Fractional Parts:** $\frac{1}{10}$ of 40
- Number Sense:** $6 \times 3, + 2, \div 2, - 2, \div 2$

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Copy this subtraction problem and fill in the missing digits:

$$\begin{array}{r} _4_ \\ - 3_2 \\ \hline 58 \end{array}$$

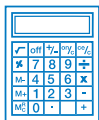
New Concept

The **operations of arithmetic** are addition, subtraction, multiplication, and division. When there is more than one operation in a problem, **parentheses** can show us the order for doing the operations. Parentheses separate a problem into parts. We do the part inside the parentheses first. In the problem below, the parentheses tell us to add 5 and 4 before we multiply by 6.

$$\begin{aligned} 6 \times (5 + 4) &= \\ 6 \times \underbrace{\quad 9 \quad} &= 54 \end{aligned}$$

Discuss What would the answer be if there were no parentheses?

Example 1



Visit www.SaxonMath.com/Int5Activities for a calculator activity.

Melody drew 8 flowers. She painted 4 flowers blue. Then she painted 2 flowers red. How many flowers were not painted?

It takes two steps to find the answer to this problem. The parentheses show us which step to take first. We add 4 and 2 to get 6. Then we subtract 6 from 8 and get 2.

$$\begin{aligned}8 - (4 + 2) &= \\8 - 6 &= 2\end{aligned}$$

We find that **2 flowers** were not painted.

Justify Why can't we subtract 4 from 8 and then add 2 for an answer of 6?

Example 2

Compare: $2 \times (3 + 4) \bigcirc (2 \times 3) + 4$

The numbers and operations on both sides are the same, but the order for doing the operations is different. We follow the proper order on both sides and find that the amount on the left is greater than the amount on the right.

$$\begin{aligned}2 \times (3 + 4) &\bigcirc (2 \times 3) + 4 \\2 \times 7 &\bigcirc 6 + 4 \\14 &> 10\end{aligned}$$

When performing the operations of arithmetic, we perform one operation at a time. If we have three numbers to add, we decide which two numbers to add first. Suppose we wish to find $4 + 5 + 6$. We may find $4 + 5$ first and then add 6, or we may find $5 + 6$ first and then add 4. Either way, the sum is 15.

$$(4 + 5) + 6 = 4 + (5 + 6)$$

Whichever way we group the addends, the result is the same. This property is called the **Associative Property of Addition**.

The Associative Property also applies to multiplication, but not to subtraction or division. Below we illustrate the **Associative Property of Multiplication**. Whichever way we group the factors, the product is the same.

$$\begin{aligned}(2 \times 3) \times 4 &\bigcirc 2 \times (3 \times 4) \\6 \times 4 &\bigcirc 2 \times 12 \\24 &= 24\end{aligned}$$

Lesson Practice

Solve each problem by following the proper order of operations:

a. $6 - (4 - 2)$

b. $(6 - 4) - 2$

c. $(8 \div 4) \div 2$

d. $8 \div (4 \div 2)$

e. $12 \div (4 - 1)$

f. $(12 \div 4) - 1$

g. Name the four operations of arithmetic.

Analyze For each problem, write the proper comparison symbol, and state whether the Associative Property applies.

h. $(8 \div 4) \div 2 \bigcirc 8 \div (4 \div 2)$

i. $(8 - 4) - 2 \bigcirc 8 - (4 - 2)$

j. $(8 \times 4) \times 2 \bigcirc 8 \times (4 \times 2)$

Written Practice


Distributed and Integrated

*1. How much money is one half of a dollar plus one fourth of a dollar?
(Inv. 2)

Formulate For problems 2–4, write an equation and find the answer.

*2. How many horseshoes are needed to shoe 25 horses?
(21)

3. Inez removed some eggs from a carton of one dozen eggs. If nine eggs remained in the carton, how many eggs did Inez remove?
(16)

*4.  **Justify** The auditorium had nine hundred fifty-six seats. During a performance only four hundred ninety-eight seats were occupied. How many seats were not occupied? Explain how you solved the problem.
(11)

5. **Connect** Write two multiplication facts and two division facts for the fact family 5, 10, and 50.
(19)

6. Compare: $3 \times (4 + 5) \bigcirc (3 \times 4) + 5$
(24)

7. $30 - (20 + 10)$
(24)

8. $(30 - 20) + 10$
(24)

*9. Compare: $4 \times (6 \times 5) \bigcirc (4 \times 6) \times 5$
(24)

10. $60 \div 7$
(22)

11. $50 \div 6$
(22)

12. $10 \overline{)44}$
(22)

13. $\begin{array}{r} \$50.36 \\ \times \quad 4 \\ \hline \end{array}$
(17)

14. $\begin{array}{r} 7408 \\ \times \quad 6 \\ \hline \end{array}$
(17)

15. $\begin{array}{r} 4637 \\ \times \quad 9 \\ \hline \end{array}$
(17)

16. $\begin{array}{r} w \\ - \$9.62 \\ \hline \$14.08 \end{array}$
(13, 14)

17. $\begin{array}{r} 4730 \\ - \quad j \\ \hline 2712 \end{array}$
(14)

18. $\begin{array}{r} \$30.00 \\ - \$ 0.56 \\ \hline \end{array}$
(13)

19. $\$3.54 + \$12 + \$1.66$
(13)

20. $\$20 - \16.45
(13)

21. **Connect** Write two addition facts and two subtraction facts for the fact family 9, 5, and 14.
(8)

22. Which digit in 256 shows the number of hundreds?
(3)

23. The Dawson Company purchased 4 telephones for \$35 each. This addition problem shows one way to find the total cost. Change the addition problem to a multiplication problem and find the total cost of the 4 telephones.
(13, 17)

$$\$35 + \$35 + \$35 + \$35$$

*24. **Predict** What is the tenth term of this counting sequence?
(1)

$$3, 6, 9, 12, 15, \dots$$

*25. **Multiple Choice** When odd numbers are divided by 2, there is a remainder of 1. Which of these odd numbers can be divided by 5 without a remainder?
(22)

A 23

B 25

C 27

D 29

26. **Represent** Draw two vertical lines.
(12)

27. **Connect** Write two multiplication facts and two division facts for the fact family 7, 8, and 56.
(19)

28. Compare: $(8 + 4) + 2$ ○ $8 + (4 + 2)$
(24)

Conclude Based on your answer, does the Associative Property apply to addition?

29. a. What number is half of 14?
(2, 23)

b. Write a fraction equal to $\frac{1}{2}$ using 14 and its half.

30. **Multiple Choice** When Maisha woke up in the morning, the temperature was 65°F . The high temperature for that day was 83°F at 4:09 p.m.
(10)

Which equation can be used to find the number of degrees the temperature increased after Maisha woke up?

A $65 + d = 83$ **B** $83 + 65 = d$ **C** $d + 83 = 65$ **D** $83 + d = 65$

Early Finishers

Real-World Connection

James has 9 storage boxes on each of 5 shelves. Each box contains 6 items. How many items are there altogether? Explain how using the Associative Property of Multiplication can make the problem easier to solve.