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Adding Whole Numbers and Money • Subtracting Whole Numbers and Money • Fact Families, Part 1

WARM-UP†

Facts Practice: 64 Addition Facts (Test A)

Mental Math: Count by 10's from 10 to 100 and from 100 to 0.
Count by 100's from 100 to 1000 and from 1000 to 0.

- a. $30 + 30$
- b. $300 + 300$
- c. $80 + 40$
- d. $800 + 400$
- e. $20 + 30 + 40$
- f. $200 + 300 + 400$

Problem Solving:

Sam thought of a number between ten and twenty. Then he gave a clue: You say the number when you count by twos and when you count by threes, but not when you count by fours. Of what number was Sam thinking?

NEW CONCEPTS

Adding whole numbers and money

To combine two or more numbers, we add. The numbers that are added together are called **addends**. The answer is called the **sum**. Changing the order of the addends does not change the sum. For example,

$$3 + 5 = 5 + 3$$

This property of addition is called the **commutative property**. When adding numbers, we add digits that have the same place value.

Example 1 Add: $345 + 67$

Solution

When we add whole numbers on paper, we write the numbers so that the place values are aligned. Then we add the digits by column.

$$\begin{array}{r} 11 \\ 345 \text{ addend} \\ + 67 \text{ addend} \\ \hline 412 \text{ sum} \end{array}$$

Changing the order of the addends does not change the sum. One way to check an addition answer is to change the order of the addends and add again.

$$\begin{array}{r} 11 \\ 67 \\ + 345 \\ \hline 412 \text{ check} \end{array}$$

†For instructions on how to use the Warm-up, please consult the preface.

Example 2 Add: $\$1.25 + \$12.50 + \$5$

Solution When we add money, we write the numbers so that the decimal points are aligned. We write \$5 as \$5.00 and add the digits in each column.

$$\begin{array}{r} \$1.25 \\ \$12.50 \\ + \$5.00 \\ \hline \$18.75 \end{array}$$

If one of two addends is zero, the sum of the addends is identical to the nonzero addend. This property of addition is called the **identity property of addition**.

$$5 + 0 = 5$$

Subtracting whole numbers and money

We subtract one number from another number to find the **difference** between the two numbers. In a subtraction problem, the **subtrahend** is taken from the **minuend**.

$$5 - 3 = 2$$

In the problem above, 5 is the minuend and 3 is the subtrahend. The difference between 5 and 3 is 2.

The commutative property does not apply to subtraction; for example, $2 - 4$ does not equal $4 - 2$.

Example 3 Subtract: $345 - 67$

Solution When we subtract whole numbers, we align the digits by place value. We subtract the bottom number from the top number and regroup when necessary.

$$\begin{array}{r} \overset{2}{3} \overset{13}{4} \overset{1}{5} \\ - \quad 67 \\ \hline 278 \end{array}$$

difference ↗

Example 4 Jim spent \$1.25 for a hamburger. He paid for it with a five-dollar bill. Find how much change he should get back by subtracting \$1.25 from \$5.

Solution Order matters when we subtract. The starting amount is put on top. We write \$5 as \$5.00. We line up the decimal points to align the place values. Then we subtract. Jim should get back **\$3.75**.

$$\begin{array}{r} \overset{4}{5} \overset{9}{0} \overset{1}{0} \\ - \$1.25 \\ \hline \$3.75 \end{array}$$

We can check the answer to a subtraction problem by adding. If we add the answer (difference) to the amount subtracted, the total should equal the starting amount. We do not need to

rewrite the problem. We just add the two bottom numbers to see whether their sum equals the top number.

SUBTRACT DOWN To find the difference	\downarrow	$\begin{array}{r} \$5.00 \\ - \$1.25 \\ \hline \$3.75 \end{array}$	\uparrow	ADD UP To check the answer
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**Fact families,
part 1**

Addition and subtraction are called **inverse operations**. We can “undo” an addition by subtracting one addend from the sum. The three numbers that form an addition fact also form a subtraction fact. For example,

$$4 + 5 = 9 \quad 9 - 5 = 4$$

The numbers 4, 5, and 9 are a **fact family**. They can be arranged to form the two addition facts and two subtraction facts shown below.

$\begin{array}{r} 4 \\ + 5 \\ \hline 9 \end{array}$	$\begin{array}{r} 5 \\ + 4 \\ \hline 9 \end{array}$	$\begin{array}{r} 9 \\ - 5 \\ \hline 4 \end{array}$	$\begin{array}{r} 9 \\ - 4 \\ \hline 5 \end{array}$
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Example 5 Rearrange the numbers in this addition fact to form another addition fact and two subtraction facts.

$$11 + 14 = 25$$

Solution We form another addition fact by reversing the addends.

$$14 + 11 = 25$$

We form two subtraction facts by making the sum, 25, the first number of each subtraction fact. Then each remaining number is subtracted from 25.

$$25 - 11 = 14$$

$$25 - 14 = 11$$

Example 6 Rearrange the numbers in this subtraction fact to form another subtraction fact and two addition facts.

$$\begin{array}{r} 11 \\ - 6 \\ \hline 5 \end{array}$$

Solution The commutative property does not apply to subtraction, so we may not reverse the first two numbers of a subtraction problem. However, we may reverse the last two numbers.

$$\begin{array}{r} 11 \\ - 6 \\ \hline 5 \end{array} \quad \begin{array}{r} 11 \\ - 5 \\ \hline 6 \end{array}$$

For the two addition facts, 11 is the sum.

$$\begin{array}{r} 5 \\ + 6 \\ \hline 11 \end{array} \quad \begin{array}{r} 6 \\ + 5 \\ \hline 11 \end{array}$$

LESSON PRACTICE

Practice set Simplify:

a. $3675 + 426 + 1357$

b. $\$6.25 + \$8.23 + \$12$

c. $5374 - 168$

d. $\$5 - \1.35

e. Arrange the numbers 6, 8, and 14 to form two addition facts and two subtraction facts.

f. Rearrange the numbers in this subtraction fact to form another subtraction fact and two addition facts.

$$25 - 10 = 15$$

MIXED PRACTICE

Problem set

1. What is the sum of 25 and 40?
2. Johnny had 137 apple seeds in one pocket and 89 in another. He found 9 more seeds in his cuff. Find how many seeds he had in all by adding 137, 89, and 9.
3. What is the difference when 93 is subtracted from 387?
4. Keisha paid \$5 for a movie ticket that cost \$3.75. Find how much change Keisha should get back by subtracting \$3.75 from \$5.
5. Tatiana had \$5.22 and earned \$1.15 more. Find how much money Tatiana had in all by adding \$1.15 to \$5.22.